FINAL
OFF-SITE AREA INTERIM ENGINEERED COVER CONSTRUCTION COMPLETION REPORT
Including Spoils Pile Consolidation

AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

MWH File No. 2090601

EPA Region 5 Records Ctr.
268189

Prepared For:

American Chemical Service NPL Site RD/RA Executive Committee
Griffith, Indiana

Prepared By:

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February 2003

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MONTGOMERY WATSON HARZA

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ACRONYMS AND ABBREVIATIONS

ACS	American Chemical Service, Inc.
BWES	Barrier Wall Extraction System
CCR	Construction Completion Report
CSA	Central States Analytical
FML	Flexible Membrane Liner
Great Lakes	Great Lakes Soil and Environmental
GWTP	Groundwater Treatment Plant
IDEM	Indiana Department of Environmental Management
IDW	Investigation-Derived Waste
IEPA	Illinois Environmental Protection Agency
ISVE	In-situ Soil Vapor Extraction
KES	Koester Environmental Services
K-P Area	Kapica-Pazmy Area
mg/kg	milligram per kilogram
NOI	Notice of Intent
NPL	National Priorities List
OFCA	Off-Site Containment Area
ONCA	On-Site Containment Area
PCB	Polychlorinated Biphenyls
PGCS	Perimeter Groundwater Collection System
PID	Photo-ionization detector
PPE	Personal Protective Equipment
ppm	parts per million
PRG	Preliminary Remediation Goal
PSVP	Performance Standard Verification Plan
RISC	Risk Integrated System of Closure
SBPA	Still Bottom Ponds Area
Site	ACS NPL Site
SWPPP	Stormwater Pollution Prevention Plan
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Construction Completion Report (CCR) details the installation of the interim engineered cover in the Off-Site Area of the American Chemical Service, Inc. (ACS) National Priorities List (NPL) Site (Site) in Griffith, Indiana during 2001. It also summarizes related activities including the Off-Site Area spoils pile consolidation and the abandonment and replacement of Off-Site Area piezometers. The United States Environmental Protection Agency (U.S. EPA) Consent Decree identification number for the interim engineered cover is 5.a, and the U.S. EPA Consent Decree identification number for the spoils pile consolidation is 1.b. (Appendix G, Consent Decree).

1.1 SITE BACKGROUND

The ACS Site is an operating chemical blending facility. Past operations have impacted five land disposal areas: the On-Site Containment Area (ONCA), the Still Bottom Ponds Area (SBPA), the Treatment Lagoons, the Off-Site Containment Area (OFCA), and the Kapica-Pazmy Area (K-P Area). The OFCA and K-P Area are collectively known as the Off-Site Area. A portion of the wetland located to the west of the ACS Site was also impacted by past facility operations.

In 1997, a continuous perimeter barrier wall was installed around the ONCA, the ACS operating facility, the OFCA, and the K-P Area. The barrier wall encloses the contamination source areas known to be at the Site. It is keyed into a clay layer approximately 20 feet below ground surface. To aid in stormwater control, the Off-Site Area was covered with an initial clay cover consisting of 9 to 12 inches of compacted clay in January and February 1998. In addition to the perimeter barrier wall and initial clay cover, a Barrier Wall Extraction System (BWES) and Perimeter Groundwater Collection System (PGCS) were installed on the Site to collect impacted groundwater for treatment in the on-site Groundwater Treatment Plant (GWTP).

The Final Remedial Design Report (Montgomery Watson, 1999) includes covering the areas of the Site that contain buried waste to enhance the current containment systems. The final remedy required a cover over the OFCA, the area contiguous to the Town of Griffith landfill, and the K-P Area. A cover was required because samples from these areas contained volatile organic compounds (VOCs) and/or polychlorinated biphenyls (PCBs) at high enough concentrations to be classified as buried waste as defined in the Consent Decree. The K-P section of the Off-Site Area also contains elevated concentrations of lead in the soil that required a cover. The specific objectives of the interim engineered cover are detailed in Section 1.2 of this CCR.

Before the interim engineered cover could be installed in the Off-Site Area, it was necessary to consolidate five spoils piles in the Off-Site Area. The spoils piles consisted of stockpiled soil and debris from previous Site investigations, construction, and construction demolition activities. The spoils piles were identified as the upper aquifer debris pile, the upper aquifer VOC soil pile (with VOC concentrations less than 500 parts per million

ppm), the K-P debris pile, the PCB soil pile, and the VOC and PCB soil pile. Each of these piles had been covered with plastic tarpaulins. In addition, MWH had accumulated approximately 600 drums containing investigation-derived waste (IDW) during previous Site investigations and construction activities. Twenty-seven of these drums were excavated during previous investigation and construction activities at the Site.

1.2 OBJECTIVES OF THE OFF-SITE AREA ENGINEERED COVER

As outlined in the Final Remedial Design Report the main objectives for the Off-Site Area engineered cover are to:

1. Eliminate potential direct contact with VOC- and PCB-contaminated soils (and lead-contaminated soils in the K-P Area);

2. Eliminate potential worker contact with VOC-contaminated groundwater;

3. Reduce the potential for contaminant migration to groundwater by reducing infiltration into these areas; and

4. Provide a surface seal for the In-situ Soil Vapor Extraction (ISVE) system to minimize potential short-circuiting and maximize the capture of VOC vapors.

In addition, covering the Off-Site Area will reduce the stormwater infiltration into the area inside the barrier wall. This will reduce the amount of groundwater that needs to be extracted and treated by the GWTP during ISVE implementation and long-term operation of the BWES.

1.3 OBJECTIVES OF THE SPOILS PILES CONSOLIDATION

The main objectives of the Off-Site Areas spoils piles consolidation are to:

1. Eliminate potential direct contact with contamination within the spoils piles by consolidating them beneath the engineered cover; and

2. Utilize the consolidated material as fill material beneath the engineered cover to promote proper surface water drainage from the engineered cover.

Additional waste consolidation activities included shearing and placement of approximately 600 drums whose contents were generated during previous investigation and construction activities. The objectives for consolidation of the drums are the same as for the spoils piles.

1.4 DEFINING THE TWO AREAS OF THE OFF-SITE AREA ENGINEERED COVER

The Off-Site Area was divided into two distinct areas that would each receive a different engineered cover system. The area that contains buried waste to be treated by ISVE is designated as the "Flexible Membrane Liner (FML)" Cover Area. This area includes the OFCA and K-P Area. The cover for this portion of the OFCA and K-P Area will consist of a 12-inch compacted clay layer and high-density polyethylene FML layer. Twelve inches of root zone, six inches of topsoil, and a vegetative layer will then be placed on top of the FML liner. The eastern boundary of this area will extend slightly farther than shown in the Final Remedial Design Report in order to fully cover the regraded PCB soil pile (shown on Figure 4) as required.

The remaining area that does not contain buried waste is designated as the "Soil Cover Area." This area will not be directly treated by ISVE. The cover for this area will consist of 18 inches of compacted clay covered with topsoil and vegetation. The area will not be covered with an FML liner. The boundaries of each area are shown on Figure 1.

During the installation of the interim engineered cover, the FML Cover Area was often referred to as the "Engineered Area" and the Soil Cover Area was referred to as the "Non-Engineered Area." These titles, however, are not completely accurate since both areas were designed and engineered by MWH. For this report the more descriptive terms "FML Cover Area" and "Soil Cover Area" will be used.

1.5 DEFINING THE TWO PHASES OF THE OFF-SITE AREA ENGINEERED COVER INSTALLATION PROCESS

Two tasks in the Consent Decree deal with the construction of the Off-Site Area Cover: the interim engineered cover (Consent Decree ID 5.a.) and the final cover (Consent Decree ID 5.b.). The installation was divided into these two phases to allow for installation and optimization of the ISVE system before installation of the FML liner to minimize potential damage to the liner if repairs or modifications were found to be necessary. The interim engineered cover consists of the initial 12 inches of compacted clay. In the FML Cover area, the final cover consists of a 60-mil high density polyethylene FML liner covered by 12 inches of earthen material and 6 inches of topsoil. The earthen material will be used as a root zone to support a healthy root matrix for the overlying vegetative layer planted in the topsoil. In the Soil Cover area (non-ISVE area), the final cover consists of an additional 6 inches of compacted clay for a total of 18 inches of compacted clay. The clay is covered with six inches of topsoil and vegetative material (grass) to prevent erosion.

As originally planned (and titled), this CCR covers primarily the installation of the interim engineered cover in the Off-Site Area. However, in the Soil Cover Area (non-ISVE area) part of the final cover was also completed during this time. It consists of 18 inches of compacted clay covered with topsoil and grass seed. Information regarding the final cover installation in the Soil Cover area is included in this report because the construction activities were conducted simultaneously with the installation of the interim engineered

cover. However, they will also be included in the Off-Site Area Final Engineered Cover CCR which will be completed at a future date.

1.6 REPORT ORGANIZATION

This report is organized in the eight sections summarized below:

- **Section 1: Introduction.** This section summarizes the Site history and lists the objectives of the work activities.

- **Section 2: Stormwater Run-off Management.** This section provides details of the actions implemented to manage stormwater run-off during the construction activities, including the preparation of a Stormwater Pollution Prevention Plan (SWPPP), the implementation of erosion control, and the construction of a detention pond.

- **Section 3: Summary of Spoils Piles Consolidation Activities.** This section summarizes preparation of the Site through the consolidating and covering of Off-Site Area spoils piles.

- **Section 4: Summary of Cover Installation Activities.** This section summarizes the grading of the subbase, investigation of existing clay conditions, and clay placement. It also summarizes the construction of drainage swales and the installation of topsoil, grass seed, and erosion matting. Finally, it summarizes the installation of a temporary access road to allow construction access to locations such as the ISVE blower shed building and well field.

- **Section 5: Piezometer Abandonment.** This section summarizes the abandonment of twelve Off-Site Area piezometers during the activities associated with the installation of the Off-Site Area interim engineered cover. It also summarizes the installation of ten replacement piezometers.

- **Section 6: Material Testing and Quality Confirmation.** This section outlines the material testing and quality confirmation methods employed to ensure the cover conformed to the design requirements. Procedures included field compaction and moisture testing, laboratory analysis, and surveying.

- **Section 7: Health and Safety.** This section summarizes the health and safety measures maintained during the project.

- **Section 8: References.** This section lists the documents referred to in the preparation of this report.

In addition, a chronological summary of construction activities is included in Appendix A and photographs are included in Appendix B.

2.0 STORMWATER RUN-OFF MANAGEMENT

2.1 STORMWATER POLLUTION PREVENTION PLAN

A SWPPP was created for the Off-Site Area to meet Indiana Department of Environmental Management (IDEM) requirements. The Plan was available at the Site starting on May 10, 2001. The SWPPP was also submitted to and approved by the Indiana Department of Natural Resources, Division of Soil Conservation. A Notice of Intent (NOI) was submitted to IDEM on May 10, 2001 for work in the Off-Site Area. The State of Indiana requires an NOI at construction sites of greater than 5 acres.

2.2 EROSION CONTROL

MWH has employed and regularly maintained erosion control measures to stabilize the Off-Site Area since the perimeter barrier wall was installed in 1997. These measures include hay bales and silt fencing. Additional silt fencing was installed around the perimeter of the Site and hay bales were placed in existing drainage swales during April 2001 in preparation for cover installation activities. In accordance with the SWPPP, a detention pond was also constructed (see Section 2.3). Figure 2 shows areas where silt fencing and hay bales were placed prior to cover installation activities.

Further erosion control was placed in the Off-Site Area as needed during construction activities. Silt fencing was also placed around the soil from the construction of the wetland pond that was stockpiled in the Off-Site Area. These measures will be maintained until the final cover is completed.

2.3 DETENTION POND AND STORMWATER RUNOFF

A detention pond was constructed during May 2001 in the northwest corner of the Off-Site Area. The detention pond is shown in Figure 2. It was required as part of the SWPPP, although it was not specified in the Final Remedial Design Report.

The detention pond receives stormwater runoff from the Off-Site Area. Five drainage swales were constructed in the Off-Site Area during August 2001 based on previously existing contours and natural drainage paths. Stormwater collects in these drainage swales and then drains to the detention pond. The detention pond empties into the drainage swale along the south side of the railroad tracks. The swale then drains into a drainage ditch that exists along the west side of the Site.

3.0 SUMMARY OF SPOILS PILE CONSOLIDATION ACTIVITIES

3.1 SITE PREPARATION

Site preparation of the Off-Site Area included the clearing and grubbing of trees and brush. Dave's Tree Service, a tree removal subcontractor, cut down trees and chipped the branches during the weeks of March 26, 2001 and April 2, 2001. The trunks and wood chips were staged in the center of the Off-Site Area. These trunks and wood chips were later moved to form two piles in the north and northeast parts of the Off-Site Area for long-term storage.

3.2 INVESTIGATION-DERIVED WASTE DRUM SHEARING AND CONSOLIDATION

Over ten years of investigations and activities on the Site, MWH accumulated approximately 600 drums. After evaluating the drum inventory, MWH developed three waste streams: IDW, purged groundwater, and excavated drums. The majority of the drums contained IDW or purged water. The IDW drums included cuttings from soil borings and personal protective equipment (PPE) from investigations conducted during and subsequent to the Remedial Investigation. The purged groundwater had been collected during the purging of monitoring wells for development and sampling.

MWH developed a management plan for the three waste streams. A task- and equipment-specific Work Plan for IDW Drum Disposal (MWH, April 17, 2001) was submitted to the U.S. EPA. It called for MWH to:

- Treat the purged groundwater in the GWTP;
- Manage the excavated drums containing non-IDW material with the other drums excavated during the drum removal that occurred in May 2001; and
- Shear the IDW and purged water drums and use them as fill to aid in reaching the final grades in the Off-Site Area.

In May 2001, after the U.S. EPA approved the Work Plan, the excavated drums were moved to the drum handling pad constructed in the On-Site Area. During November 2001, they were opened, sampled, and classified for disposal based on the waste stream type. These drums were disposed of along with the other drums excavated from the On-Site Area during May 2001 (U.S. EPA Consent Decree ID 1.c.).

In accordance with the Work Plan, MWH managed the IDW and purged groundwater from May 15 through May 24, 2001. Purged groundwater was collected from the drums, transported to the GWTP, and treated by the GWTP. After the drums had been emptied, MWH sheared and consolidated the IDW drummed waste into manageable pieces. A large cutting attachment connected to an excavator was used to cut the drums and debris into

smaller pieces (see photo 2, Appendix B). After being sheared, drum carcasses and solid IDW were placed in a low area on the north side of the Off-Site Area that required additional fill to reach final design grades (see Figures 3 and 4).

3.3 SPOILS PILES PLACEMENT

During 1996 and 1997, MWH constructed a barrier wall around the On-Site and Off-Site Areas to contain buried source material. MWH also constructed the PGCS to capture impacted groundwater before it migrated Off-Site and send it to the GWTP for treatment. Excavation for these two construction activities generated excess soil spoils. MWH identified five types of spoils material that was generated:

- **Upper Aquifer Debris Pile:** general debris excavated from the upper aquifer;
- **Upper Aquifer VOC Soil Pile:** soil excavated from the upper aquifer with VOC concentrations less than 500 parts per million (ppm);
- **The K-P Spoils Pile:** general debris from demolition of structures in the K-P area;
- **The VOC and PCB Soil Pile:** soil containing VOC concentrations greater than 500 ppm and PCBs; and
- **The PCB Soil Pile:** soil excavated in areas shown to contain PCBs during the Remedial Investigation sampling.

MWH developed a Spoils Management Plan that was included in the November 6, 1996 letter to the U.S. EPA entitled "Management and Temporary Storage of Construction Derived Soils." The plan was developed to manage the spoils generated or expected to be generated on the Site. In accordance with the plan, the material was segregated into the five piles listed above located in the Off-Site Area. Figure 3 shows the location of the spoils piles prior to consolidation. The piles were covered with plastic tarpaulins in September 1997.

The Final Remedial Design Report called for the management and containment of the spoils piles in the Off-Site Area. During May 2001, the spoils were consolidated for containment beneath the cover at the locations shown on Figure 4. The following summarizes the consolidation and re-grading activities that occurred.

- **Upper Aquifer Debris Pile:** The upper aquifer debris pile consisted of assorted landfill debris collected from the upper aquifer region of soil during the 1997 installation of the perimeter barrier wall. The debris pile was consolidated during the week of May 14, 2001.
- **Upper Aquifer VOC Soil Pile:** The upper aquifer VOC soil pile consisted of soil with VOC concentrations below 500 ppm collected from the upper aquifer region

during the 1997 installation of the perimeter barrier wall. This soil pile was also consolidated during the week of May 14, 2001.

- **The K-P Spoils Pile:** The K-P spoils pile was sheared into manageable pieces between May 15 and 24, 2001. The sheared debris were relocated to a low area on the north side of the Off-Site Area that required additional fill to reach final grades. This area was located between the upper aquifer debris pile and the upper aquifer VOC soil pile mentioned above.

  This was conducted in conjunction with the shearing of the IDW drummed waste described above in Section 3.2 of this CCR. This task was performed in accordance with the Agency-approved Work Plan for IDW Drum Disposal.

- **The VOC and PCB Soil Pile:** The VOC and PCB soil pile was re-graded from May 29, 2001 to May 31, 2001.

- **The PCB Soil Pile:** The PCB soil pile was also re-graded from May 29, 2001 to May 31, 2001.

Figure 4 shows locations of these spoils piles after consolidation and regrading activities and prior to the installation of the interim engineered cover.

3.4 SHORT-TERM COVER

After shearing and consolidation of the IDW drums and spoils piles, a 3-inch to 6-inch short-term clay layer was placed over the consolidated piles. Clay placement and compaction were completed on June 12, 2001. This short-term cover was installed to minimize worker exposure to the newly consolidated piles prior to the installation of the interim engineering cover.

3.5 HEALTH AND SAFETY

Regular air monitoring was conducted due to the presence of VOCs in many of the spoils piles during the consolidation activities. Work was conducted in Level D PPE except for isolated timeframes when air monitoring results indicated that respirators (Level C PPE) were needed. Air monitoring logs are included in Appendix C.

4.0 SUMMARY OF COVER INSTALLATION ACTIVITIES

4.1 SELECTION AND ANALYTICAL TESTING OF IMPORTED CLAY AND TOPSOIL SOURCES

In early 2001, MWH selected a clay borrow source located in Merrillville, Indiana to obtain clay for the grading of the subbase and installation of the interim engineered cover. Samples from this imported clay source were collected for laboratory analysis to demonstrate that the material met the IDEM Risk Integrated System of Closure (RISC) Nonresidential Default Closure Levels and the U.S. EPA Region IX Preliminary Remediation Goals (PRGs).

The clay source was sampled and analyzed before importing clay for the grading of the subbase and again before importing clay for the installation of the interim engineered cover. Table 1 summarizes the analytical results of the three composite samples collected in March 2001 and the one composite sample collected in July 2001. The imported clay was found to meet the established screening-level criteria and to be acceptable for use on the Site. Discussion of the analytical results is included in Section 6.1. Appendix D contains the complete data.

The imported clay was also tested for various geotechnical parameters. The geotechnical testing results conformed to the design requirements. Results are summarized in Table 2. Complete results are included in Appendix E.

A local topsoil borrow source was also selected for use in topsoil placement in the Off-Site Area. A topsoil sample was collected and analyzed in August 2001. The analytical results were screened against the same criteria as the imported clay. The imported topsoil was found to meet the established screening-level criteria and be acceptable for use on the Site. Discussion of the analytical results is included in Section 6.3. Appendix D contains the complete data.

4.2 GRADING OF SUBBASE

Preparation of the subbase for the interim engineered cover was completed in conjunction with the consolidation of the spoils piles. During the end of May 2001 and the beginning of June 2001, MWH graded existing soils to create the subbase for the interim engineered cover system. The final subbase topography was contoured to promote surface water drainage. Areas were regraded where necessary to improve stormwater runoff, reduce stormwater run-on, and limit ponding.

Imported clay was also placed and compacted as needed to improve drainage. Portions of this installed clay formed a part of the interim engineered cover.

Swales were incorporated into the subbase grading plan at specified locations to direct surface water runoff towards designated areas. Grading of the subbase for the engineered

cover and surrounding areas primarily conformed to the proposed contours shown on drawing C-3 in the Final Remedy. The one exception is Swale 5, which was added to maximize use of the existing contours and minimize stormwater sheeting. Figure 5 depicts the baseline topography of the Off-Site Area after final grading of the subbase.

4.3 INVESTIGATION OF EXISTING CLAY CONDITIONS

By the time that the interim engineered cover was being installed, most of the Off-Site Area already had up to 15 inches of compacted clay over it. Clay was initially placed in the Off-Site Area during January and February 1998. Additional clay was placed in May and June 2001 as discussed in Section 4.2. This clay formed both a short-term cover and a subbase for the future engineered cover.

After final grading of the subbase in early June 2001, MWH investigated the existing clay. This was done to ascertain the clay's condition, thickness, and degree of compaction to determine what additional clay would need to be added to meet the design requirements for the engineered cover. The thickness of the existing clay was determined by coring through the clay with a power auger at 52 locations and measuring the thickness of the clay. The results of MWH's investigation, shown on Figure 6, indicated that the existing clay thicknesses varied from zero to 15 inches.

Great Lakes Soil and Environmental (Great Lakes) was subcontracted to conduct geotechnical testing of the existing clay during June 2001 to ensure that the existing clay met the Final Remedial Design Report requirements. Great Lakes conducted field geotechnical testing at the locations shown on Figure 7. Table 3 summarizes the laboratory geotechnical results and Table 4 summarizes the field compaction testing data. Appendix F contains the entire geotechnical data package for the existing clay, including 77 in-place compaction tests, four field samples, and 19 in-place clay thickness measurements.

The geotechnical testing results indicated that the clay met the 95% compaction requirement and was suitable for use as part of the cover system. Using the clay thickness and compaction data, MWH divided the Off-Site Area into five areas of similar clay thicknesses and conditions. The five areas are summarized in the table below and are shown on Figure 6. The existing condition of each area is listed along with the amount of additional clay needed to meet the required thickness. When evaluating the additional action required for each area, MWH responded conservatively in order to ensure the cover conformed to design requirements.

Area(s)	Existing Condition	Additional Clay Needed
1	The thickness was measured at 20 locations ranging from 7" (at two locations) to 15" (at three locations) for an average of 12.1" of acceptable existing clay	5" to 11" of additional clay added (depending on location)
2, 4	No acceptable existing clay	12" to 18" of additional clay added (depending on location)
3, 5	2" to 4" of acceptable existing clay; due to such a small amount of existing clay, these areas were considered to have no acceptable existing clay.	12" to 18" of additional clay added (depending on location)

4.4 CLAY PLACEMENT

Koester Environmental Services (KES) was selected by MWH to complete the installation of the interim engineered cover in the Off-Site Area. Placement and compaction of imported clay began in late July 2001 and was completed in late August 2001.

The project specifications in the Construction Quality Assurance Plan (CQAP, Montgomery Watson, June 1999) called for 95% compaction at optimum moisture content. Field practices allowed for a moisture content range between optimum moisture and optimum moisture +2 percent.

The optimum moisture standard used by MWH for this project was determined by geotechnical testing of four borrow source samples performed by Great Lakes. Optimum moisture ranged from 16.5% to 18.5% (Table 2 and Appendix E). The optimum moisture for one of the four clay samples tested to determine optimum moisture was reported as 18.5% based upon graphical interpolation data included in Appendix E. MWH engineers compared this result with the other three optimum moisture results from the same borrow source (which ranged from 16.5 to 17.0%). MWH reviewed the graphical interpolation data and determined that the 18.5% result was an anomaly and that clay at that moisture percentage would potentially be too plastic to effectively compact. Therefore, the optimum moisture values used were 16.5% to 17.0%.

From the week of July 30, 2001 until the week of August 27, 2001 dump trucks delivered the clay and bulldozers spread the clay across the Site in 6-inch thick lifts. A water truck, using water from the GWTP, sprayed water over the newly spread clay to aid in compaction. Tractors with either a sheepsfoot roller or a smooth drum roller were then used to compact the clay. Site surveys were conducted regularly by S&H Surveyors retained by KES. KES used these surveys to aid in reaching the target elevations. Approximately 17,000 total cubic yards of clay were placed.

Once the clay had been conditioned and compacted, Great Lakes conducted moisture and compaction testing on completed areas. Four to eight tests per acre were conducted per

six-inch lift of clay installed. Test locations are shown on Figure 8. Test results are included in Table 5.

If a given area did not meet the MWH-specified moisture content or compaction requirement when tested, the area was reworked. Additional water was added as needed and the area was recompacted and then retested. If necessary, the process was repeated until the required moisture content and density was achieved. Once all areas of clay had passed compaction and moisture testing, the clay was surveyed at final grade. The final elevation of the top of clay is shown in Figure 9.

4.5 DRAINAGE SWALE CONSTRUCTION

During the installation of the interim cover, MWH developed and shaped five drainage swales, shown on Figure 10, to manage stormwater runoff. Using pre-existing site contours, MWH designed the drainage swales to slope to the north and the west so that stormwater runoff would flow to the detention pond located in the northwest corner of the Off-Site Area (see Section 2.3).

After being surveyed to confirm proper slope and elevation, the drainage swales were covered with either rip rap, vegetation, or erosion matting during August and September 2001. This was done to reduce erosion as water flowed through them. Part of Swale 2 and all of Swale 5 were covered with erosion matting. The western portion of Swale 4 was covered with topsoil and grass (see Section 4.6).

The three exterior swales, Swale 1, Swale 3, and the eastern portion of Swale 4, were covered with rip rap. They were first lined with Mirafi 1160N geotextile fabric. The fabric is a non-woven geotextile fabric composed of polypropylene fibers. It is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. The fabric possesses a weight of 14.5 oz/yd^2, a puncture strength of 235 lbs., and a grab tensile strength of 380 lbs. After placement of the Mirafi 1160N, the three exterior swales were lined with approximately 2,700 square yards of rip rap (see Figure 10 and detail A of Figure 11). The limestone rip rap, imported from Crown Point, Indiana, was uniformly graded between 3 and 8 inches in diameter, with approximately 50% between 4 and 6 inches.

In February 2002, Austgen Company was subcontracted by KES to install the geotextile fabric in a portion of Swale 3 that had not received the fabric prior to KES' demobilization.

4.6 TOPSOIL, GRASS SEED, AND EROSION MATTING INSTALLATION

The compacted clay was covered with approximately 2,500 cubic yards of imported topsoil. This topsoil was placed over the Soil Cover Area in the northern and eastern portions of the Off-Site Area during the end of August 2001 and the beginning of September 2001. The topsoil was installed to a depth of six inches. Figure 12 shows the final elevations of topsoil. Topsoil was not placed in the FML Cover Area.

A seeding subcontractor, Slusser Company, was selected to hydroseed areas covered with topsoil. Approximately 12,000 square yards of the 22,000 square yards of the Soil Cover area was covered with vegetative cover (grass). The Class R seed met Indiana Department of Transportation Standard Specifications.

The remaining portion of the Soil Cover Area, the eastern edge of the Site, was used to stockpile soil from the construction of the pond during the wetland restoration in September 2001. The stockpiled soil was surrounded with silt fencing installed by a silt fencing subcontractor, Security Fencing Company. MWH periodically inspects the cover area and maintains the material as needed.

Erosion control matting was placed in areas susceptible to erosion due to steep slopes or high stormwater flow concentrations. Concurrent with hydroseeding in September 2001 and later in October 2001, Slusser placed approximately 20,500 square yards of the erosion matting in areas of the Off-Site Area not already protected by grass or rip rap. The erosion matting consisted of 70% agricultural straw and 30% coconut fiber matrix. The erosion matting was covered with heavyweight photodegradable polypropylene netting with ultraviolet additives to delay breakdown.

Figure 10 summarizes the as-built conditions of the Off-Site Area, including drainage swales and grass. The figure also shows the locations of stockpiled wood chips and logs and soil stockpiled for later use in the root zone of the final cover.

4.7 INSTALLATION OF ACCESS ROAD

A temporary access road, shown on Figure 10, was constructed during the week of September 17, 2001 to provide access to locations such as the Off-Site Area ISVE blower building and well field. The temporary access road consists of a geotextile fabric with a nine-inch gravel subbase, as shown in detail B of Figure 11. The road connects the south gate of the Off-Site Area to the ISVE blower shed.

5.0 PIEZOMETER ABANDONMENT

During the final grading and installation of the interim engineered cover, some of the groundwater piezometers in the Off-Site Area were damaged. MWH made the decision to remove all of the piezometers in the Off-Site Area and replace them after the completion of the interim cover due to the increased expense and time that would have been required to work around the piezometers without damaging them.

The piezometers were removed using a chain and backhoe. The piezometers located outside the barrier wall were filled with bentonite powder during the removal process. Twelve piezometers were removed during construction activities in May and August 2001: P3, P5, P10, P11, P97, P98, P99, P100, P101, P102, P103, and P104. Piezometers P95 and P96 were left in place because they are located safely out of the primary work areas used during the construction of the interim cover.

After consultation with the U.S. EPA and IDEM, MWH selected ten locations to install replacement piezometers in the Off-Site Area. Drilling subcontractor Boart Longyear installed the ten replacement piezometers designated as P109, P110, P111, P112, P113, P114, P115, P116, P117, and P118. They were installed on September 16 and 17, 2001 are shown on Figure 13. Boring logs and a well construction summary table are included in Appendix G.

Air monitoring readings were collected from soil at each piezometer location by inserting the photo-ionization detector (PID) probe into each drilling sample. These results are recorded on the soil boring logs. Also included in Appendix G are air monitoring readings collected in the breathing space during the installation process. Level C air respirators were worn when air monitoring results exceeded Health and Safety Plan action levels.

6.0 MATERIAL TESTING AND QUALITY CONFIRMATION

Material testing and quality confirmation was conducted in accordance with the CQAP (Montgomery Watson, June 1999) and the Performance Standard Verification Plan (PSVP, Montgomery Watson, June 1999) to ensure the cover conformed to the design requirements.

6.1 ANALYSIS OF IMPORTED CLAY FOR CONTAMINANTS

Clay was imported from the same clay borrow source located in Merrillville, Indiana for both the spoils piles consolidation activities and interim engineered cover activities. Clay samples from this source were collected and tested for contaminants both in March and July 2001. The clay source was analyzed on two occasions to document that the clay consistency of the source had not changed.

Three clay samples were collected from this source on March 14, 2001 to confirm the clay could be used to cover the consolidated spoils piles. One sample was collected on July 26, 2001 to confirm the clay could be used as a part of the interim cover. Simalabs International analyzed the three clay samples collected on March 14, 2001. The clay sample collected July 26, 2001 was analyzed by Central States Analytical (CSA). The laboratory data sheets for these samples are contained in Appendix D and the results and screening comparison are summarized in Table 1.

To ensure that no contaminated material was brought to the site, samples of the imported clay were collected and analyzed. Because the the Final Remedial Design Report, including Construction Quality Assurance Plan (CQAP) and Performance Standard Verification Plan (PSVP), does not outline standards to be used to determine acceptable import material, the U.S. EPA Region IX Preliminary Remediation Goals (PRGs) and IDEM RISC Nonresidential Default Closure Levels were used as guidelines. The clay was found to meet these requirements with the following exceptions (see Table 1). The typical laboratory reporting limits for seven semi-volatile organic compounds (2,4-dinitrophenol, 2-nitroaniline, benzo(a)pyrene, bis(2-chloroethyl)ether, dibenz(a,h)anthracene, N-nitrosodi-n-propylamine, and N-nitrosodimethylamine) are higher than the lower of the two guideline values used. However, because the reporting limits for each of these seven compounds is lower than the second guideline value, the clay was found to be acceptable for on site use.

Arsenic concentrations (a peak value of 9.4 milligrams per kilogram [mg/kg] from the March 2001 sampling event and 6.7 mg/kg from the July 2001 sampling event) were detected in the clay that met the IDEM RISC level of 20 mg/kg but exceeded the Region IX PRG of 2.7 mg/kg. However, comparison of this arsenic detection with the regional (Greater Chicago Metropolitan Area) background range (1.1 to 24 mg/kg) determined in a study published by the Illinois Environmental Protection Agency (IEPA) in 1994 indicates that this data is well below the upper limit of the published regional background concentration range. The findings of the IEPA study, titled *A Summary of Selected*

Background Conditions for Inorganics in Soil, are based upon analysis of the Greater Chicago Metropolitan Area. The IEPA study was considered because no similar study or background arsenic values have been published specifically for Indiana.

6.2 VISUAL INSPECTION AND GEOTECHNICAL TESTING OF IMPORTED CLAY

The imported clay was visually inspected and found to be free of grass, roots, brush, other organic material, debris, and refuse and therefore deemed suitable for cover material. The clay was installed in six-inch lifts as specified by MWH.

The imported clay installed as part of the interim engineered cover was analyzed for geotechnical characteristics including particle size and permeability. Great Lakes Consultants performed the analyses. The clay was found to meet the design requirements and the MWH-specifications. The geotechnical testing reports are included in Appendix E and the results are summarized in Table 2.

Great Lakes conducted in-place soil density testing on the installed clay. Compacted soil was tested to ensure that it was compacted to 95% of maximum dry density at the optimum moisture range. In-place soil testing was conducted with a nuclear density testing unit. The field quality assurance test results were compared to the maximum dry density and optimum moisture as determined in the laboratory. If either the density or moisture requirements were not met, the non-passing areas were rewetted, recompacted, and retested until the criteria were met. As Table 5 shows, all locations eventually met the compaction and moisture requirements.

6.3 ANALYSIS OF IMPORTED TOPSOIL FOR CONTAMINANTS

To ensure that no contaminated material was brought to the site, a sample of the imported topsoil was collected on August 9, 2001 and analyzed by Simalabs International. The topsoil chemical analytical results were screened against the same criteria as the clay and no detections were reported in the soil that exceeded either screening criteria (see Table 1). However, the typical laboratory reporting limits for seven semi-volatile organic compounds (2,4-dinitrophenol, 2-nitroaniline, benzo(a)pyrene, bis(2-chloroethyl)ether, dibenz(a,h)anthracene, N-nitrosodi-n-propylamine, and N-nitrosodimethylamine) are higher than the lower of the two guideline values used. However, because the reporting limits for each of these seven compounds is lower than the second guideline value, the topsoil was found to be acceptable for on site use.

The reporting limit for arsenic in the topsoil sample analyzed was higher than both of the screening criteria used. However, the reporting limit is within published regional background levels (IEPA, 1994).

6.4 MATERIAL ANALYSIS

MWH reviewed and approved the product specifications prior to installation for the geotextile fabric used in the construction of the drainage swales. MWH found the mass, thickness, apparent opening size, grab tensile strength, and puncture strength of the geotextile fabric to be satisfactory (see Section 4.5). During installation MWH visually inspected the geotextile fabric and did not discover any deficiencies.

6.5 SURVEYING

The Site was surveyed before, during, and after the placement of the interim engineered cover to confirm that the desired final grades and minimum clay thicknesses were obtained. These surveys were used to develop final "as-built" drawings. Surveying was performed by S&H Surveyors and certified by an Indiana-licensed surveyor. Table 6 summarizes the depth of placed clay according to survey control point locations shown on Figure 9. The final contours and clay thicknesses are based upon survey data collected by S&H. MWH engineers used Eagle Point software to independently calculate and verify the clay thicknesses calculated by KES.

Quality control field surveying was performed by the Area Survey Company under the supervision of an Illinois-licensed surveyor. Area Survey created a baseline survey of the Off-Site Area on June 12-13, 2001 and created a topographical map on August 30, 2001 of portions of the Site after the final clay elevations had been reached. MWH used this information to verify the accuracy of the work of the primary surveyor, S&H Surveyors. The survey results from S&H and Area Survey were found to coincide.

After the completion of the interim engineered cover, the total in-place clay (usable existing clay plus new clay placed during this work) for the FML Cover Area was 12 inches or greater. The total depth of in-place clay for the Soil Cover Area was 18 inches or greater.

7.0 HEALTH AND SAFETY

A kickoff health and safety meeting for the project was conducted on July 23, 2001 for all active construction workers. Daily tailgate health and safety meetings were conducted throughout the project. During these meetings, the importance of safe work practices, especially when working with heavy equipment, was regularly emphasized. Emphasis was also placed upon preventing heat stress due to the hot summer weather that lasted through most of the project. A cooling station was established and utilized regularly.

Work was conducted in Level D PPE, which included safety shoes, hard hats, and safety glasses. Because VOCs were potentially present in the spoils pile, air monitoring was conducted regularly during all spoils management activities. These air monitoring results, included in Appendix C, dictated the proper PPE in which the work was performed. Air monitoring was not conducted during the installation of the interim cover because the work involved the placement of non-contaminated material.

During the installation of the replacement piezometers, air monitoring was conducted in the breathing space and from soil samples at each piezometer location. Level C air respirators were worn as dictated by air monitoring results for the surrounding breathing space. See Appendix G and Section 5.0 for more information.

8.0 REFERENCES

1. *A Summary of Selected Background Conditions for Inorganics in Soil*, Illinois Environmental Protection Agency, August 1994.

2. *Management and Temporary Storage of Construction Derived Spoils*, Montgomery Watson, November 6, 1996.

3. *Performance Standard Verification Plan, ACS NPL Site*, Montgomery Watson, June 1999.

4. *Construction Quality Assurance Plan, ACS NPL Site*, Montgomery Watson, June 1999.

5. *Final Remedial Design Report, Final Remedy, ACS NPL Site*, Montgomery Watson, August 1999.

6. *Work Plan for IDW Drum Disposal, ACS NPL Site*, Montgomery Watson, April 2001.

7. *Stormwater Pollution Prevention Plan for Construction of Off-Site Area Cover, ACS NPL Site*, Montgomery Watson, May 2001.

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Table 1
Chemical Analytical Testing and Risk Assessment
of Borrow Source Material
ACS NPL Site
Griffith, Indiana

Analyte	U.S.EPA Region IX Preliminary Remediation Goals[1]	IDEM RISC Nonresidential Default Closure Levels[2]	Sample Collected / Units	Clay 1 East 3/14/01			Clay 1 Center 3/14/01			Clay 1 West 3/14/01			Clay 2 7/26/01			Topsoil 1 8/9/01		
					Result	Q		Result	Q		Result	Q		Result	Q		Result	Q
Volatile Organic Compounds																		
1,1,1,2-Tetrachloroethane	7,000	790	µg/Kg	<	10	U	<	10	U	<	10	U		NA		<	10	U
1,1,1-Trichloroethane	1,400,000	35,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
1,1,2,2-Tetrachloroethane	900	110	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
1,1,2-Trichloroethane	1,900	300	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
1,1-Dichloroethane	2,100,000	58,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
1,1-Dichloroethene	120	58	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
1,2-Dichorobenzene	370,000	270,000	µg/Kg	<	10	U	<	10	U	<	10	U	<	300	U		NA	
1,2-Dichloroethane	760	150	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
1,2-Dichloropropane	770	250	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
1,3-Dichlorobenzene	52,000	1,800	µg/Kg	<	10	U	<	10	U	<	10	U	<	300	U		NA	
1,4-Dichlorobenzene	8,100	3,400	µg/Kg	<	10	U	<	10	U	<	10	U	<	300	U		NA	
2-Butanone	28,000,000	260,000	µg/Kg	<	10	U	<	10	U	<	10	U	<	50	U	<	10	U
2-Chloroethyl vinyl ether	NE	NE	µg/Kg		NA			NA			NA		<	50	U		NA	
2-Hexanone	NE	NE	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
4-Methyl-2-Pentanone	2,900,000	39,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Acetone	6,200,000	41,000	µg/Kg	<	50	U	<	50	U	<	50	U	<	50	U	<	50	U
Acrolein	340	220	µg/Kg	<	100	U	<	100	U	<	100	U		NA		<	100	U
Acrylonitrile	510	NE	µg/Kg	<	100	U	<	100	U	<	100	U		NA		<	100	U
Benzene	1,500	670	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Bromodichloromethane	2,400	630	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Bromoform	310,000	2,700	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Bromomethane	13,000	NE	µg/Kg	<	10	U	<	10	U	<	10	U	<	10	U	<	10	U
Carbon Disulfide	720,000	82,000	µg/Kg	<	10	U	<	10	U	<	10	U		NA		<	10	U
Carbon tetrachloride	530	290	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Chlorobenzene	540,000	27,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Chloroethane	6,500	5,200	µg/Kg	<	10	U	<	10	U	<	10	U	<	10	U	<	10	U
Chloroform	520	1,200	µg/Kg	<	5	U	<	5	U	<	5	U	=	15		<	5	U
Chloromethane	2,700	NE	µg/Kg	<	10	U	<	10	U	<	10	U	<	10	U	<	10	U
cis-1,2-Dichloroethene	150,000	5,800	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
cis-1,3-Dichloropropene	NE	NE	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Dibromochloromethane	2,700	NE	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Ethylbenzene	230,000	200,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
m,p-Xylene	NE	NE	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Methyl-t-Butyl Ether	37,000	5,600	µg/Kg	<	10	U	<	10	U	<	10	U	<	10	U	<	10	U
Methylene chloride	21,000	1,800	µg/Kg	<	10	U	<	10	U	<	10	U	<	50	U	=	19	
o-Xylene	NE	NE	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Styrene	1,700,000	720,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Tetrachloroethene	19,000	640	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Toluene	520,000	240,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
trans-1,2-Dichloroethene	210,000	14,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
trans-1,3-Dichloropropene	NE	NE	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Trichloroethene	6,100	3,000	µg/Kg	<	5	U	<	5	U	<	5	U	<	10	U	<	5	U
Trichlorofluoromethane	2,000,000	NE	µg/Kg	<	10	U	<	10	U	<	10	U	<	10	U	<	10	U
Vinyl Acetate	1,400,000	430,000	µg/Kg	<	10	U	<	10	U	<	10	U		NA		<	10	U
Vinyl chloride	830	13	µg/Kg	<	10	U	<	10	U	<	10	U	<	10	U	<	10	U

Table 1
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ACS NPL Site
Griffith, Indiana

Analyte	U.S.EPA Region IX Preliminary Remediation Goals[1]	IDEM RISC Nonresidential Default Closure Levels[2]	Sample Collected / Units	Clay 1 East 3/14/01 Result	Q	Clay 1 Center 3/14/01 Result	Q	Clay 1 West 3/14/01 Result	Q	Clay 2 7/26/01 Result	Q	Topsoil 1 8/9/01 Result	Q
Semi-Volatile Organic Compounds (SVOC)													
1,2,4-Trichlorobenzene	3,000,000	77,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
1,2-Dichlorobenzene	370,000	270,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
1,2-Diphenylhydrazine	3,100	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
1,3-Dichlorobenzene	52,000	1,800	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
1,4-Dichlorobenzene	8,100	3,400	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
2,4,5-Trichlorophenol	88,000,000	690,000	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 300	U	< 1600	U
2,4,6-Trichlorophenol	220,000	5,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
2,4-Dichlorophenol	2,600,000	3,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
2,4-Dimethylphenol	18,000,000	25,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
2,4-Dinitrophenol	1,800,000	820	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 1500	U	< 1600	U
2,4-Dinitrotoluene	1,800,000	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
2,6-Dichlorophenol	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	NA		< 330	U
2,6-Dinitrotoluene	880,000	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
2-Chloronaphthalene	27,000,000	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
2-Chlorophenol	240,000	10,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
2-Methylnaphthalene	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
2-Methylphenol	44,000,000	39,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
2-Nitroaniline	50,000	29	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 600	U	< 1600	U
2-Nitrophenol	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
3,3´-Dichlorobenzidine	5,500	210	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 600	U	< 1600	U
3-Nitroaniline	NE	NE	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 600	U	< 1600	U
3/4-Methylphenol	NE	33,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
4,6-Dinitro-2-methylphenol	NE	NE	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 300	U	< 1600	U
4-Bromophenyl phenyl ether	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
4-Chloro-3-methylphenol	NE	NE	µg/Kg	< 660	U	< 660	U	< 660	U	< 600	U	< 660	U
4-Chloroaniline	3,500,000	2,700	µg/Kg	< 660	U	< 660	U	< 660	U	< 300	U	< 660	U
4-Chlorophenyl phenyl ether	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
4-Nitroaniline	NE	NE	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 600	U	< 1600	U
4-Nitrophenol	7,000	NE	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 300	U	< 1600	U
Acenaphthene	38,000	1,200,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Acenaphthylene	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Acetophenone	1,600	NE	µg/Kg	< 330	U	< 330	U	< 330	U	NA		< 330	U
Aniline	430,000	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Anthracene	100,000,000	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Benzidine	11	NE	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 1500	U	< 1600	U
Benzo[a]anthracene	2,900	15,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Benzo[a]pyrene	290	1,500	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Benzo[b]fluoranthene	2,900	15,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Benzo[g,h,i]perylene	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Benzo[k]fluoranthene	29,000	39,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Benzoic acid	100,000,000	1,600,000	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 1500	U	< 1600	U
Benzyl alcohol	100,000,000	140,000	µg/Kg	< 660	U	< 660	U	< 660	U	< 1500	U	< 660	U
Bis(2-chloroethoxy)methane	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Bis(2-chloroethyl)ether	620	12	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Bis(2-chloroisopropyl)ether	8,100	260	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Bis(2-ethylhexyl)phthalate	180,000	980,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Butyl benzyl phthalate	100,000,000	930,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U

Table 1
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Analyte	U.S.EPA Region IX Preliminary Remediation Goals[1]	IDEM RISC Nonresidential Default Closure Levels[2]	Sample Collected / Units	Clay 1 East 3/14/01		Clay 1 Center 3/14/01		Clay 1 West 3/14/01		Clay 2 7/26/01		Topsoil 1 8/9/01	
				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Semi-Volatile Organic Compounds													
Carbazole	120,000	20,000	µg/Kg	< 330	U	< 330	U	< 330	U	NA		< 330	U
Chrysene	290,000	25,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Di-n-butyl phthalate	NE	2,000,000	µg/Kg	< 330	U	< 330	U	< 330	U	= 4000		< 330	U
Di-n-octyl phthalate	10,000,000	2,000,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Dibenz[a.h]anthracene	290	1,500	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Dibenzofuran	5,100,000	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Diethyl phthalate	100,000,000	1,300,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Dimethyl phthalate	100,000,000	1,400,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Fluoranthene	30,000,000	880,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Fluorene	33,000,000	1,100,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Hexachlorobenzene	1,500	3,900	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Hexachlorobutadiene	32,000	44,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Hexachloro-cyclopentadiene	5,900,000	2,000,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Hexachloroethane	180,000	7,700	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Indeno[1,2,3cd]pyrene	2,900	3,100	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Isophorone	2,600,000	18,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
N-Nitrosodi-n-propylamine	350	2	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
N-Nitrosodimethylamine	48	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
N-Nitrosodiphenylamine	500,000	32,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Naphthalene	190,000	170,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Nitrobenzene	110,000	340	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Pentachlorophenol	11,000	660	µg/Kg	< 1600	U	< 1600	U	< 1600	U	< 300	U	< 1600	U
Phenanthrene	NE	NE	µg/Kg	< 330	U	< 330	U	< 330	U	< 600	U	< 330	U
Phenol	100,000,000	320,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Pyrene	54,000,000	570,000	µg/Kg	< 330	U	< 330	U	< 330	U	< 300	U	< 330	U
Pyridine	880,000	NE	µg/Kg	< 330	U	< 330	U	< 330	U	NA		< 330	U
Pesticides/PCBs													
4,4'-DDD	17	120	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
4,4'-DDE	12	86	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
4,4'-DDT	12	86	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Aldrin	0.15	0.80	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Alpha-BHC	0.59	0.024	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Aroclor 1016	29	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.25	U	< 0.033	U
Aroclor 1221	1	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.25	U	< 0.033	U
Aroclor 1232	1	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.25	U	< 0.033	U
Aroclor 1242	1	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.25	U	< 0.033	U
Aroclor 1248	1	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.25	U	< 0.033	U
Aroclor 1254	1	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.25	U	< 0.033	U
Aroclor 1260	1	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.25	U	< 0.033	U
Aroclor 1262	NE	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	NA		< 0.033	U
Aroclor 1268	NE	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	NA		< 0.033	U
Beta-BHC	2.1	0.086	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Chlordane	11	39	mg/Kg	< 0.33	U	< 0.33	U	< 0.33	U	< 0.10	U	< 0.33	U
delta-BHC	NE	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Dieldrin	0.15	0.15	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Endosulfan I	NE	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Endosulfan II	NE	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Endosulfan Sulfate	NE	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U

Table 1
Chemical Analytical Testing and Risk Assessment
of Borrow Source Material
ACS NPL Site
Griffith, Indiana

Analyte	U.S.EPA Region IX Preliminary Remediation Goals[1]	IDEM RISC Nonresidential Default Closure Levels[2]	Sample Collected / Units	Clay 1 East 3/14/01		Clay 1 Center 3/14/01		Clay 1 West 3/14/01		Clay 2 7/26/01		Topsoil 1 8/9/01	
				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Pesticides/PCBs													
Endrin	260	15	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Endrin Aldehyde	NE	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Endrin Ketone	NE	NE	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Gamma-BHC	2.9	0.10	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Heptachlor	0.55	1.2	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Heptachlor Epoxide	0.27	1	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Methoxychlor	4,400	180	mg/Kg	< 0.033	U	< 0.033	U	< 0.033	U	< 0.10	U	< 0.033	U
Toxaphene	2.2	12	mg/Kg	< 0.33	U	< 0.33	U	< 0.33	U	< 0.50	U	< 0.33	U
Total PCBs	1	5.3	mg/Kg	NA		NA		NA		< 0.25	U	NA	
Inorganics													
Aluminum	100,000	NE	mg/Kg	12000		16000		7300		NA		NA	
Antimony	820	37	mg/Kg	< 0.96	U	< 0.93	U	< 0.94	U	< 0.5	U	NA	
Arsenic	2.7	20	mg/Kg	9.4[3]		8.1[3]		6.5[3]		= 6.7[3]		< 23	U
Barium	100,000	5,900	mg/Kg	54		68		33		= 71		= 77	
Beryllium	2,200	3,200	mg/Kg	1		1.1		0.52		NA		NA	
Cadmium	810	77	mg/Kg	0.98		0.92		< 0.48	U	< 0.1	U	= 1.4	
Calcium	NE	NE	mg/Kg	25000		14,000		31000		NA		NA	
Chromium	450	10,120	mg/Kg	20		19		12		= 20		= 15	
Cobalt	100,000	NE	mg/Kg	8.2		11		6.9		NA		NA	
Copper	76,000	1,700	mg/Kg	18		20		13		NA		= 25	
Cyanide, Total	35	NE	mg/Kg	< 0.5	U	< 0.5	U	< 0.5	U	NA		NA	
Iron	100,000	NE	mg/Kg	16000		16000		10000		NA		NA	
Lead	750	230	mg/Kg	12		12		10		= 16		= 23	
Magnesium	NE	NE	mg/Kg	15000		10000		16000		NA		NA	
Manganese	32,000	NE	mg/Kg	370		410		350		NA		NA	
Mercury	610	32	mg/Kg	< 0.048	U	< 0.048	U	< 0.045	U	= 0.02		= 0.02	J
Nickel	41,000	2,700	mg/Kg	20		21		24		NA		= 16	
Potassium	NE	NE	mg/Kg	3600		3100		1300		NA		NA	
Reactive Cyanide	35	410	mg/Kg	NA		NA		NA		< 10	U	NA	
Selenium	10,000	53	mg/Kg	0.49		< 0.23	U	< 0.24	U	= 0.4		= 1.2	
Silver	10,000	87	mg/Kg	< 1.9	U	< 2	U	< 1.9	U	< 0.1	U	< 0.53	U
Sodium	NE	NE	mg/Kg	100		95		98		NA		NA	
Thallium	130	13	mg/Kg	< 0.24	U	< 0.23	U	< 0.24	U	< 1	U	NA	
Vanadium	14,000	NE	mg/Kg	24		25		14		NA		NA	
Zinc	100,000	10,000	mg/Kg	47		45		35		NA		= 49	

Notes:

[1]Industrial Soil Remediation Goals were taken from the U.S.EPA Region IX Preliminary Remediation Goals (PRGs) for Industrial Soils Screening (11/01/00)

[2]Nonresidential Default Closure Levels were taken from the IDEM Risk Integrated System of Closure (RISC) (2/15/01)

[3]Arsenic value for clay sample exceeds Region IX PRGs, however comparison with the regional background range (1.1 to 24 mg/kg) determined in a study published by the IEPA (1994) indicates that data from this site is well below the upper limit of the published regional background concentration range. See further discussion in text, section 6.1.

NE -- Not Established

NA -- Not Analyzed

U -- Non-detect

J -- Analyte was detected between the Method Detection Limit (MDL) and the Reporting Limit (RL)

µg/Kg -- micrograms per kilogram (or ppb)

mg/Kg -- milligrams per kilogram (or ppm)

Table 2
Geotechnical Testing Results of Borrow Source Material
ACS NPL Site
Griffith, Indiana

Geotechnical Test Description	Specified Method	Testing Frequency	Units	Sample			
				BS-1	BS-2	BS-3	BS-4
Soil Classification	USCS System	1 test every 5,000 cubic yards	n/a	CL, lean clay with sand	CL, lean clay with sand	CL, lean clay with sand	CL, lean clay with sand
Grain Size Analysis	ASTM D422	1 test every 5,000 cubic yards	% + 3 inches	0.0	0.0	0.0	0.0
			% Gravel	0.0	4.1	5.7	5.2
			% Sand	15.4	13.1	11.7	13.1
			% Silt	44.3	33.3	35.2	34.1
			% Clay	40.3	49.5	47.4	47.6
Grain Size Analysis	ASTM D1140	1 test every 5,000 cubic yards	% Fines	82.0	82.7	80.3	78.5
Optimum Moisture Content	ASTM D2216	1 test every 5,000 cubic yards	%	16.5	18.5	17.0	17.0
Atterburg Limits	ASTM D4138	1 test every 5,000 cubic yards	Liquid Limit, L_L	30	37	34	33
			Plastic Limit, P_L	15	18	17	17
			Plasticity Index, P_I	15	19	17	16
Moisture-Density Curve/Proctor Density	ASTM D698	1 test every 5,000 cubic yards & all changes in material	lbs./ft.^{3}	113.5	110.0	109.0	111.5
Specific Gravity	ASTM D854	1 test every 5,000 cubic yards & all changes in material	n/a	2.55	2.63	2.63	2.62
Coefficient of Permeability	ASTM D5084	1 test every 5,000 cubic yards & all changes in material	cm/sec	3.9E-08	2.2E-08	2.4E-08	2.1E-08

Notes:
n/a = not applicable
BS = Borrow Source

Table 3
Geotechnical Testing Results of Existing Off-Site Area Cover Material[1]
ACS NPL Site
Griffith, Indiana

Geotechnical Test Description	Specified Method	Units	Sample			
			1	2	3	4
Soil Classification	USCS System	n/a	CL, lean clay with sand	CL, lean clay with sand	CL, lean clay with sand	CL, lean clay with sand
Grain Size Analysis	ASTM D422	% + 3 inches	0.0	0.0	0.0	0.0
		% Gravel	8.5	8.2	5.8	6.3
		% Sand	14.9	16.3	16.1	15.5
		% Silt	31.2	33.5	32.3	35.1
		% Clay	45.4	42.0	45.8	43.0
Grain Size Analysis	ASTM D1140	% Fines	n/a	n/a	n/a	n/a
Optimum Moisture Content	ASTM D2216	%	16.0	15.0	14.5	16.5
Atterburg Limits	ASTM D4138	Liquid Limit, L_L	29	27	28	27
		Plastic Limit, P_L	15	15	14	13
		Plasticity Index, P_I	14	12	14	14
Moisture-Density Curve/Proctor Density	ASTM D698	pcf	110.0	115.0	118.0	115.0
Specific Gravity	ASTM D854	n/a	2.529	2.685	2.642	2.600
Coefficient of Permeability	ASTM D5084	cm/sec	n/a	n/a	n/a	n/a

Notes:

n/a = not applicable

1. This cover material was placed during site activities conducted in 1996 and during spoils piles consolidation activities conducted in May 2001.

Table 4
Existing Off-Site Area Cover Material
Compaction Test Results
ACS, NPL Site
Griffith, Indiana

Sampling Location	Coordinates		Date Tested	Probe Depth (inches)	Dry Density (pcf)	Proctor (pcf)	% Compaction	Specification, % Proctor	Pass/ Fail	Comments
	Easting	Northing								
1	5716.41	6373.39	6/15/2001	12	115.2	109.0	105.7	95.0	Pass	
2	5670.08	6279.89	6/15/2001	12	118.0	109.0	108.3	95.0	Pass	
3	5623.38	6185.65	6/15/2001	12	120.3	109.0	110.4	95.0	Pass	
4	5577.42	6092.89	6/15/2001	12	120.7	109.0	110.7	95.0	Pass	
5	5530.77	5998.76	6/15/2001	12	122.8	109.0	112.7	95.0	Pass	
6	5484.75	5905.88	6/15/2001	12	118.5	109.0	108.7	95.0	Pass	
7	5438.17	5811.88	6/15/2001	12	120.2	109.0	110.3	95.0	Pass	
8	5392.09	5718.88	6/15/2001	12	121.8	109.0	111.7	95.0	Pass	
10	5646.29	6349.74	6/15/2001	12	121.1	109.0	111.1	95.0	Pass	
11	5599.96	6256.24	6/15/2001	6	125.6	109.0	115.2	95.0	Pass	
12	5553.26	6161.99	6/15/2001	6	121.5	109.0	111.5	95.0	Pass	
13	5507.30	6069.23	6/15/2001	6	122.9	109.0	112.8	95.0	Pass	
14	5460.66	5975.11	6/15/2001	6	122.0	109.0	111.9	95.0	Pass	
15	5414.64	5882.23	6/26/2001	12	110.2	109.0	101.1	95.0	Pass	
16	5368.05	5788.22	6/26/2001	12	112.8	109.0	103.5	95.0	Pass	
17	5321.98	5695.23	6/15/2001	12	120.8	109.0	110.8	95.0	Pass	
19	5622.90	6419.72	6/15/2001	12	114.5	109.0	105.0	95.0	Pass	
20	5577.48	6325.81	6/15/2001	6	119.5	109.0	109.6	95.0	Pass	
21	5529.97	6232.16	6/15/2001	12	122.1	109.0	112.0	95.0	Pass	
22	5483.91	6139.22	6/15/2001	6	125.4	109.0	115.0	95.0	Pass	
23	5437.22	6044.98	6/15/2001	6	118.1	109.0	108.3	95.0	Pass	
24	5390.85	5951.39	6/15/2001	12	119.3	109.0	109.4	95.0	Pass	
25	5344.56	5857.98	6/15/2001	12	120.1	109.0	110.2	95.0	Pass	
26	5298.00	5764.02	6/15/2001	6	124.6	109.0	114.3	95.0	Pass	
27	5252.26	5671.71	6/15/2001	12	114.9	109.0	105.4	95.0	Pass	
28	5552.79	6396.07	6/15/2001	12	113.8	109.0	104.4	95.0	Pass	
29	5507.36	6302.16	6/15/2001	6	126.4	109.0	116.0	95.0	Pass	
30	5459.85	6208.50	6/15/2001	12	116.0	109.0	106.4	95.0	Pass	
31	5413.80	6115.56	6/15/2001	6	121.1	109.0	111.1	95.0	Pass	
32	5367.10	6021.32	6/15/2001	6	121.8	109.0	111.7	95.0	Pass	
33	5320.73	5927.74	6/15/2001	12	116.4	109.0	106.8	95.0	Pass	
34	5274.44	5834.33	6/15/2001	12	123.9	109.0	113.7	95.0	Pass	
35	5227.88	5740.37	6/15/2001	6	126.8	109.0	116.3	95.0	Pass	
37	5529.40	6466.05	6/15/2001	6	122.9	109.0	112.8	95.0	Pass	
38	5483.07	6372.55	6/15/2001	12	122.6	109.0	112.5	95.0	Pass	
39	5436.74	6279.05	6/15/2001	12	112.8	109.0	103.5	95.0	Pass	
40	5390.11	6184.93	6/15/2001	12	122.1	109.0	112.0	95.0	Pass	
41	5344.08	6092.05	6/15/2001	6	121.7	109.0	111.7	95.0	Pass	
42	5297.51	5998.05	6/15/2001	6	122.9	109.0	112.8	95.0	Pass	
43	5251.09	5904.36	6/15/2001	6	122.9	109.0	112.8	95.0	Pass	
44	5204.66	5810.68	6/26/2001	12	109.6	109.0	100.6	95.0	Pass	
45	5158.53	5717.58	6/26/2001	12	120.7	109.0	110.7	95.0	Pass	
47	5459.29	6442.40	6/15/2001	12	112.8	109.0	103.5	95.0	Pass	
48	5412.96	6348.90	6/18/2001	6	117.9	109.0	108.2	95.0	Pass	
49	5366.63	6255.39	6/18/2001	12	118.0	109.0	108.3	95.0	Pass	
50	5319.99	6161.28	6/18/2001	12	109.2	109.0	100.2	95.0	Pass	

Table 4
Existing Off-Site Area Cover Material
Compaction Test Results
ACS, NPL Site
Griffith, Indiana

Sampling Location	Coordinates		Date Tested	Probe Depth (inches)	Dry Density (pcf)	Proctor (pcf)	% Compaction	Specification, % Proctor	Pass/ Fail	Comments
	Easting	Northing								
51	5273.97	6068.39	6/18/2001	12	127.5	109.0	117.0	95.0	Pass	
52	5227.39	5974.39	6/18/2001	12	122.5	109.0	112.4	95.0	Pass	
53	5180.97	5880.71	6/26/2001	12	110.7	109.0	101.6	95.0	Pass	
54	5134.55	5787.02	6/26/2001	12	108.5	109.0	99.5	95.0	Pass	
55	5088.42	5693.93	6/18/2001	12	111.8	109.0	102.6	95.0	Pass	
56	5435.90	6512.38	6/18/2001	12	116.4	109.0	106.8	95.0	Pass	
57	5389.57	6418.88	6/26/2001	12	114.5	109.0	105.0	95.0	Pass	
58	5342.88	6324.66	6/26/2001	12	113.9	109.0	104.5	95.0	Pass	
59	5296.91	6231.88	6/18/2001	6	125.2	109.0	114.9	95.0	Pass	
61	5204.25	6044.88	6/18/2001	6	124.9	109.0	114.6	95.0	Pass	
62	5157.92	5951.37	6/26/2001	12	122.0	109.0	111.9	95.0	Pass	
63	5111.33	5857.34	6/26/2001	12	112.7	109.0	103.4	95.0	Pass	
64	5065.43	5764.72	6/26/2001	12	108.0	109.0	99.1	95.0	Pass	
66	5319.45	6395.23	6/26/2001	12	110.0	109.0	100.9	95.0	Pass	
67	5272.77	6301.00	6/18/2001	12	112.6	109.0	103.3	95.0	Pass	
68	5226.79	6208.22	6/18/2001	6	123.6	109.0	113.4	95.0	Pass	
69	5180.07	6113.93	6/18/2001	12	125.4	109.0	115.0	95.0	Pass	
70	5134.13	6021.22	6/18/2001	12	117.7	109.0	108.0	95.0	Pass	
71	5087.80	5927.72	6/18/2001	6	117.3	109.0	107.6	95.0	Pass	
72	5041.21	5833.68	6/18/2001	6	120.5	109.0	110.6	95.0	Pass	
73	4995.31	5741.06	6/18/2001	12	108.4	109.0	99.4	95.0	Pass	
74	5342.40	6558.71	6/18/2001	12	112.3	109.0	103.0	95.0	Pass	
77	5203.41	6278.21	6/18/2001	12	116.1	109.0	106.5	95.0	Pass	
78	5156.52	6183.57	6/18/2001	6	123.5	109.0	113.3	95.0	Pass	
79	5111.03	6091.07	6/18/2001	12	122.5	109.0	112.4	95.0	Pass	
80	5064.42	5997.70	6/18/2001	6	124.8	109.0	114.5	95.0	Pass	
84	5133.29	6254.55	6/18/2001	12	112.6	109.0	103.3	95.0	Pass	
85	5086.40	6159.92	6/18/2001	12	118.5	109.0	108.7	95.0	Pass	
86	5040.91	6067.42	6/18/2001	12	114.1	109.0	104.7	95.0	Pass	
93	5132.16	6487.30	6/26/2001	12	108.9	109.0	99.9	95.0	Pass	labeled incorrectly as "95" in field records
94	5155.40	6651.37	6/26/2001	12	113.1	109.0	103.8	95.0	Pass	labeled incorrectly as "96" in field records

Notes:

Testing locations have been surveyed using a Global Positioning System (GPS) unit.

Moisture results have not been included in this table because the material tested was existing, not freshly compacted.

Table 5
Clay Cover Moisture and Compaction Test Results
Off-Site Interim Engineered Cover
ACS, NPL Site
Griffith, Indiana

Sampling Location	Coordinates		Date Tested	Probe Depth (inches)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Specification, % Moisture	Specification, % Proctor	Pass/ Fail	Lift Number[1]	Comments
	Easting	Northing											
2 a	5626.3	6214.9	8/10/01	6	107.6	17.3	110.0	97.8	17.0	95.0	Pass	2	
2 b	"	"	8/10/01	10	107.7	17.5	110.0	97.9	17.0	95.0	Pass	1	
3 a	5583.5	6098.1	8/10/01	6	109.8	17.1	110.0	99.8	17.0	95.0	Pass	2	
3 b	"	"	8/10/01	10	111.6	17.0	110.0	101.5	17.0	95.0	Pass	1	
4 a	5552.2	6027.3	8/10/01	6	110.2	17.7	110.0	100.2	17.0	95 0	Pass	2	
4 b	"	"	8/10/01	10	108.8	17.6	110.0	98.9	17.0	95.0	Pass	1	
5 a	5512.9	5940.0	8/10/01	6	107.2	17.6	110.0	97.5	17.0	95.0	Pass	2	
5 b	"	"	8/10/01	10	109.1	17.5	110.0	99.2	17.0	95.0	Pass	1	
6 a	5483.9	5866.1	8/10/01	6	106.3	18.2	110.0	96.6	17.0	95.0	Pass	2	
6 b	"	"	8/10/01	10	105.9	17.8	110.0	96.3	17.0	95.0	Pass	1	
7 a	5463.3	5811.4	8/10/01	6	104.9	17.2	110.0	95.4	17 0	95.0	Pass	2	
7 b	"	"	8/10/01	10	105.7	17.6	110.0	96.1	17 0	95.0	Pass	1	
10 a	5610.8	6270.9	8/10/01	6	107.3	17.4	110.0	97.5	17.0	95.0	Pass	2	
10 b	"	"	8/10/01	10	111.6	17.2	110.0	101.5	17.0	95.0	Pass	1	
11 a	5572.3	6176.6	8/10/01	6	107.2	17.4	110.0	97.5	17.0	95.0	Pass	2	
11 b	"	"	8/10/01	10	110.0	17.1	110.0	100.0	17.0	95.0	Pass	1	
12 a	5523.1	6070.3	8/10/01	6	105.1	17.3	110.0	95.5	17.0	95.0	Pass	2	
12 b	"	"	8/10/01	10	104.8	18.1	110.0	95.3	17.0	95.0	Pass	1	
13 a	5490.1	5999.7	8/10/01	6	105.5	17.1	110.0	95.9	17.0	95.0	Pass	2	
13 b	"	"	8/10/01	10	106.2	17.8	110.0	96.5	17.0	95.0	Pass	1	
14 a	5442.8	5907.2	8/10/01	6	108.2	17.3	110.0	98.4	17.0	95.0	Pass	2	
14 b	"	"	8/10/01	10	106.5	17.4	110.0	96.8	17.0	95.0	Pass	1	
15 a	5402.7	5829.4	8/10/01	6	112.8	17.4	110.0	102.5	17.0	95.0	Pass	2	
15 b	"	"	8/10/01	10	105.2	18.1	110.0	95.6	17.0	95.0	Pass	1	
17 a*	5322.0	5695.2	8/9/01	6	112.1	16.8	113.5	98.8	16.5	95.0	Pass	2	
17 b*	"	"	8/9/01	12	114 6	16.5	113.5	101.0	16.5	95.0	Pass	1	
20 a	5552.5	6283.5	8/10/01	6	108.1	17.4	110.0	98.3	17.0	95.0	Pass	2	
20 b	"	"	8/10/01	10	110.6	17.3	110.0	100.5	17 0	95.0	Pass	1	
21 a	5520.6	6212 6	8/10/01	6	110.0	18.0	110.0	100.0	17.0	95.0	Pass	2	
21 b	"	"	8/10/01	10	110.0	17.9	110.0	100.0	17.0	95.0	Pass	1	
22 a	5468.1	6092.6	8/10/01	6	108.7	17.1	110.0	98.8	17.0	95.0	Pass	2	
22 b	"	"	8/10/01	10	114.2	17.1	110.0	103.8	17.0	95.0	Pass	1	
23 a	5419.8	5971.8	8/10/01	6	104.9	17.8	110.0	95.4	17.0	95.0	Pass	2	
23 b	"	"	8/10/01	10	106 6	17.4	110.0	96.9	17.0	95.0	Pass	1	
24 a	5382.9	5879.8	8/10/01	6	106.4	17.4	110.0	96.7	17.0	95.0	Pass	2	
24 b	"	"	8/10/01	10	107.2	17.3	110.0	97.5	17.0	95.0	Pass	1	
25*	5344.6	5858.0	8/8/01	6	117.1	16.7	113.5	103.2	16.5	95.0	Pass	1	
26 a	5272.3	5815.3	8/8/01	6	109 1	16.9	113.5	96.1	16.5	95.0	Pass	2	
26 b	"	"	8/8/01	12	109.9	16 7	113.5	96.8	16.5	95 0	Pass	1	
26 c	5284.3	5731.5	8/14/01	6	107.8	17.4	110.0	98.0	17.0	95.0	Pass	2	
27 a	5261.7	5749.0	8/9/01	6	108.3	16.9	113.5	95.4	16.5	95.0	Pass	2	
27 b	"	"	8/9/01	12	108.9	16.6	113.5	95.9	16.5	95.0	Pass	1	
28 a*	5522.2	6356.4	8/9/01	4	112.5	17.5	113.5	99.1	16.5	95.0	Pass	1	
28 b*	"	"	8/10/01	4	108.7	17.0	113.5	95.8	16.5	95.0	Pass	2	
29 a*	5487.6	6269.2	8/9/01	4	110.1	16.6	113.5	97.0	16.5	95.0	Pass	1	
29 b*	"	"	8/10/01	4	109.5	17.4	113.5	96.5	16.5	95 0	Pass	2	

Table 5
Clay Cover Moisture and Compaction Test Results
Off-Site Interim Engineered Cover
ACS, NPL Site
Griffith, Indiana

Sampling Location	Coordinates		Date Tested	Probe Depth (inches)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Specification, % Moisture	Specification, % Proctor	Pass/ Fail	Lift Number[1]	Comments
	Easting	Northing											
30 a*	5441.9	6160.3	8/9/01	4	107.8	16.8	113.5	95.0	16.5	95.0	Pass	1	
30 b*	"	"	8/10/01	4	108.7	17.9	113.5	95.8	16.5	95.0	Pass	2	
31	5395.9	6052.6	8/10/01	4	108.3	16.7	113.5	95.4	16.5	95.0	Pass	1	
32	5349.2	5936.1	8/10/01	4	108.9	18.2	113.5	95.9	16.5	95.0	Pass	1	
33 a	5317.0	5886.8	8/8/01	6	110.2	17.1	113.5	97.1	16.5	95.0	Pass	2	
33 b	"	"	8/8/01	12	113.7	17.0	113.5	100.7	16.5	95.0	Pass	1	
34 a	5193.2	5883.3	8/8/01	6	109.5	17.7	113.5	96.5	16.5	95.0	Pass	2	
34 b	"	"	8/8/01	12	109.3	16.7	113.5	96.5	16.5	95.0	Pass	1	
34 c	5251.8	5755.4	8/14/01	6	107.5	17.6	110.0	97.7	17.0	95.0	Pass	2	
35 a*	5245.7	5721.1	8/8/01	6	108.9	16.9	113.5	95.9	16.5	95.0	Pass	2	
35 b*	"	"	8/8/01	12	109.0	16.6	113.5	96.0	16.5	95.0	Pass	1	
35 c*	"	"	8/14/01	6	106.6	17.9	110.0	96.9	17.0	95.0	Pass	2	
37 a	5470.7	6489.5	8/15/01	8	105.7	17.2	110.0	96.1	17.0	95.0	Pass	1	
37 b,c	5520.9	6440.3	8/27/01	6 and 12	106.5	18.1	110.0	96.8	17.0	95.0	Pass	2,3	Both 6 and 12 inch tests were conducted and passed, though only the 6 inch result was recorded
38 a	5441.1	6357.7	8/13/01	6	109.0	17.6	110.0	99.1	17.0	95.0	Pass	1	
38 b*	5464.4	6416.6	8/15/01	8	108.0	17.3	110.0	98.2	17.0	95.0	Pass	2	
38 c*	"	"	8/24/01	6	108.1	16.9	110.0	98.3	17.0	95.0	Pass	3	
39	5388.6	6246.2	8/13/01	4	110.2	17.3	110.0	100.2	17.0	95.0	Pass	1	
40	5300.9	6170.0	8/24/01	4	106.0	18.2	110.0	96.3	17.0	95.0	Pass	1	
41	5310.0	6130.0	8/24/01	4	105.4	18.5	110.0	95.8	17.0	95.0	Pass	1	
42 a	5287.3	5926.1	8/8/01	6	111.6	17.1	113.5	98.3	16.5	95.0	Pass	2	
42 b	"	"	8/8/01	12	112.4	16.9	113.5	99.0	16.5	95.0	Pass	1	
43 a	5243.3	5905.8	8/8/01	6	107.9	18.5	113.5	95.1	16.5	95.0	Pass	2	
43 b	"	"	8/8/01	12	108.6	18.3	113.5	95.7	16.5	95.0	Pass	1	
44 a	5123.0	5910.5	8/8/01	6	113.7	17.2	113.5	100.2	16.5	95.0	Pass	2	
44 b	"	"	8/8/01	12	112.9	16.6	113.5	99.5	16.5	95.0	Pass	1	
45 a	5126.3	5783.5	8/9/01	6	107.9	17.3	113.5	95.1	16.5	95.0	Pass	2	
45 b	"	"	8/9/01	12	109.1	18.1	113.5	96.1	16.5	95.0	Pass	1	
45 c	5190.9	5691.5	8/14/01	6	105.2	18.4	110.0	95.6	17.0	95.0	Pass	2	
47 a	5411.2	6410.3	8/13/01	6	105.9	17.7	110.0	96.3	17.0	95.0	Pass	2	
47 b	5425.5	6417.0	8/15/01	8	105.8	18.9	110.0	96.2	17.0	95.0	Pass	1	
48	5380.5	6341.2	8/13/01	4	105.3	18.9	110.0	95.7	17.0	95.0	Pass	1	
49	5327.4	6226.7	8/13/01	4	111.9	17.8	110.0	101.7	17.0	95.0	Pass	1	
50	5239.1	6159.5	8/24/01	4	104.6	17.7	110.0	95.0	17.0	95.0	Pass	1	
51	5198.4	6144.8	8/24/01	4	107.6	17.3	110.0	97.9	17.0	95.0	Pass	1	
52 a	5220.4	5949.9	8/8/01	6	108.4	18.5	113.5	95.5	16.5	95.0	Pass	2	
52 b	"	"	8/8/01	12	108.7	18.4	113.5	95.8	16.5	95.0	Pass	1	
53 a	5115.6	5967.1	8/8/01	6	109.0	16.9	113.5	96.0	16.5	95.0	Pass	2	
53 b	"	"	8/8/01	12	110.1	16.8	113.5	97.0	16.5	95.0	Pass	1	
53 c	5145.7	5848.3	8/13/01	6	106.8	17.4	110.0	97.1	17.0	95.0	Pass	2	
53 d	5206.3	5772.4	8/14/01	6	108.0	17.2	110.0	98.2	17.0	95.0	Pass	2	

Table 5
Clay Cover Moisture and Compaction Test Results
Off-Site Interim Engineered Cover
ACS, NPL Site
Griffith, Indiana

Sampling Location	Coordinates		Date Tested	Probe Depth (inches)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Specification, % Moisture	Specification, % Proctor	Pass/ Fail	Lift Number[1]	Comments
	Easting	Northing											
54 a*	5136.4	5770.6	8/8/01	6	107.9	17.3	113.5	95.1	16.5	95.0	Pass	2	Probe depth recorded incorrectly as 12" on field report
54 b*	"	"	8/8/01	12	108.4	17.0	113.5	95.5	16.5	95.0	Pass	1	
54 c	"	"	8/13/01	6	107.5	17.4	110.0	97.7	17.0	95.0	Pass	2	
54 d*	"	"	8/14/01	6	108.8	17.4	110.0	98.9	17.0	95.0	Pass	2	
55 a	5154.0	5709.1	8/9/01	6	110.1	16.9	113.5	97.0	16.5	95.0	Pass	2	
55 b	"	"	8/9/01	12	111.4	16.6	113.5	98.1	16.5	95.0	Pass	1	
55 c	5120.4	5686.8	8/13/01	6	108.9	17.6	110.0	99.0	17.0	95.0	Pass	2	
56 a	5388.6	6522.8	8/15/01	8	105.9	18.2	110.0	96.3	17.0	95.0	Pass	1	
56 b,c	5432.4	6485.5	8/27/01	6 and 12	108.0	17.4	110.0	98.1	17.0	95.0	Pass	2,3	Both 6 and 12 inch tests were conducted and passed, though only the 12 inch result was recorded
57 a	5355.7	6390.8	8/13/01	6	108.3	17.9	110.0	98.5	17.0	95.0	Pass	1	
57 b	5421.3	6436.4	8/24/01	6	105.8	17.4	110.0	96.2	17.0	95.0	Pass	2	
58	5311.5	6294.9	8/13/01	4	108.7	17.9	110.0	98.8	17.0	95.0	Pass	1	
59	5261.0	6213.7	8/24/01	4	104.5	18.6	110.0	95.0	17.0	95.0	Pass	1	
60	5190.6	6187.9	8/22/01	4	105.9	17.7	110.0	96.3	17.0	95.0	Pass	1	
61 a	5209.0	5991.3	8/8/01	6	114.0	16.6	113.5	100.4	16.5	95.0	Pass	2	
61 b	"	"	8/8/01	12	116.0	16.9	113.5	102.7	16.5	95.0	Pass	1	
62 a	5163.1	5970.9	8/8/01	6	109.8	17.1	113.5	96.7	16.5	95.0	Pass	2	
62 b	"	"	8/8/01	12	110.2	16.8	113.5	97.1	16.5	95.0	Pass	1	
62 c*	5101.8	5898.1	8/13/01	6	106.5	18.8	110.0	96.8	17.0	95.0	Pass	2	
62 d*	"	"	8/14/01	6	105.8	18.3	110.0	96.1	17.0	95.0	Pass	2	
63 a	5074.2	5919.6	8/8/01	6	111.8	16.9	113.5	98.5	16.5	95.0	Pass	2	
63 b	"	"	8/8/01	12	112.1	16.5	113.5	98.8	16.5	95.0	Pass	1	
63 c	5085.3	5806.7	8/13/01	6	113.1	17.5	110.0	102.8	17.0	95.0	Pass	2	
63 d*	"	"	8/14/01	6	105.3	18.2	110.0	95.6	17.0	95.0	Pass	2	
64 a	5054.5	5810.6	8/9/01	6	108.5	16.7	113.5	95.6	16.5	95.0	Pass	2	
64 b	"	"	8/9/01	12	113.6	16.7	113.5	100.0	16.5	95.0	Pass	1	
64 c	5075.2	5772.9	8/13/01	6	109.3	17.2	110.0	99.3	17.0	95.0	Pass	2	
65	5360.3	6440.8	8/15/01	8	109.3	17.8	110.0	99.4	17.0	95.0	Pass	1	
66 a	5322.7	6388.1	8/15/01	6	109.7	17.3	110.0	99.8	17.0	95.0	Pass	1	
66 b	5297.0	6398.7	8/22/01	6	105.8	17.8	110.0	96.2	17.0	95.0	Pass	2	
67	5284.3	6309.1	8/15/01	6	105.1	17.5	110.0	95.5	17.0	95.0	Pass	1	
68	5198.1	6219.5	8/24/01	4	109.1	16.3	110.0	99.2	17.0	95.0	Pass	1	
70	5096.2	6013.3	8/8/01	6	110.1	16.7	113.5	97.0	16.5	95.0	Pass	1	
71 a	5163.2	5828.0	8/9/01	6	112.7	17.1	113.5	99.3	16.5	95.0	Pass	2	
71 b	"	"	8/9/01	12	113.4	16.9	113.5	100.0	16.5	95.0	Pass	1	
72 a	5032.9	5845.1	8/9/01	6	109.1	17.2	113.5	96.1	16.5	95.0	Pass	2	
72 b	"	"	8/9/01	12	110.9	16.9	113.5	97.7	16.5	95.0	Pass	1	
73 a	5012.5	5739.5	8/9/01	6	109.7	17.5	113.5	96.7	16.5	95.0	Pass	2	
73 b	"	"	8/9/01	12	110.4	17.0	113.5	97.3	16.5	95.0	Pass	1	
74	5309.1	6560.6	8/15/01	8	114.9	17.4	110.0	104.5	17.0	95.0	Pass	1	
75 a	5290.3	6385.7	8/17/01	6	106.1	18.7	110.0	96.4	17.0	95.0	Pass	1	
75 b	5335.8	6468.6	8/24/01	6	104.6	17.0	110.0	95.0	17.0	95.0	Pass	2	
76	5280.2	6307.8	8/17/01	6	107.9	17.3	110.0	98.1	17.0	95.0	Pass	1	
77	5199.4	6380.4	8/22/01	6	110.0	17.1	110.0	100.0	17.0	95.0	Pass	1	
78	5178.2	6177.3	8/8/01	6	108.9	18.4	113.5	95.9	16.5	95.0	Pass	1	

Table 5
Clay Cover Moisture and Compaction Test Results
Off-Site Interim Engineered Cover
ACS, NPL Site
Griffith, Indiana

Sampling Location	Coordinates		Date Tested	Probe Depth (inches)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Specification, % Moisture	Specification, % Proctor	Pass/ Fail	Lift Number[1]	Comments
	Easting	Northing											
79	5112.7	6092.6	8/8/01	6	110.6	17.2	113.5	97.4	16.5	95.0	Pass	1	
80 a	5052.1	6066.1	8/8/01	4	110.5	17.1	113.5	97.4	16.5	95.0	Pass	2	
80 b	"	"	8/8/01	10	109.1	16.6	113.5	96.1	16.5	95.0	Pass	1	
81	5245.5	6460.1	8/17/01	6	105.9	17.8	110.0	96.8	17.0	95.0	Pass	1	
82	5235.3	6365.4	8/17/01	6	108.1	17.4	110.0	98.2	17.0	95.0	Pass	1	
83	5195.5	6447.6	8/24/01	6	105.7	17.4	110.0	96.0	17.0	95.0	Pass	1	
84	5196.7	6245.1	8/8/01	4	111.9	17.2	113.5	98.6	16.5	95.0	Pass	1	
85	5137.8	6185.1	8/8/01	6	112.0	16.9	113.5	98.7	16.5	95.0	Pass	1	
86 a	5063.9	6133.5	8/8/01	4	108.3	18.5	113.5	95.4	16.5	95.0	Pass	2	
86 b	"	"	8/8/01	10	110.9	17.1	113.5	97.8	16.5	95.0	Pass	1	
87	5208.3	6616.5	8/22/01	6	105.5	18.1	110.0	95.9	17.0	95.0	Pass	1	
88	5168.3	6577.7	8/22/01	6	104.8	18.3	110.0	95.2	17.0	95.0	Pass	1	
92	5141.7	6648.5	8/22/01	6	107.6	18.5	110.0	97.8	17.0	95.0	Pass	1	
blower pad 1 a*	5243.7	6007.8	8/15/01	6	105.5	18.8	110.0	95.9	17.0	95.0	Pass	1	
blower pad 1 b*	"	"	8/17/01	8	109.8	17.5	110.0	99.8	17.0	95.0	Pass	2	
blower pad 2 a*	5239.0	5994.2	8/15/01	8	108.0	18.0	110.0	98.2	17.0	95.0	Pass	1	
blower pad 2 b*	"	"	8/17/01	8	110.9	17.2	110.0	100.8	17.0	95.0	Pass	2	
blower pad 3	5268.9	5981.6	8/17/01	8	106.4	18.4	110.0	96.7	17.0	95.0	Pass	2	
blower pad 4	5278.1	5994.9	8/17/01	8	112.6	17.1	110.0	102.4	17.0	95.0	Pass	2	
blower pad 5	5255.0	5994.1	8/17/01	8	108.3	17.7	110.0	98.4	17.0	95.0	Pass	2	
EW-19 a	5483.4	5904.6	9/4/01	6	112.2	18.0	110.0	102.0	17.0	95.0	Pass	2	labeled as MW 19C on field form
EW-19 b	"	"	9/4/01	12	112.0	18.2	110.0	101.8	17.0	95.0	Pass	1	labeled as MW 19C on field form
EW-15 a	5552.8	6048 3	9/4/01	6	106.1	17.2	110.0	96.4	17.0	95.0	Pass	2	labeled as MW D19 on field form
EW-15 b	"	"	9/4/01	12	107.5	17.5	110.0	97.7	17.0	95.0	Pass	1	labeled as MW D19 on field form
EW-20B a	5432 2	6455.1	9/4/01	6	108.2	17.6	110.0	98.3	17.0	95.0	Pass	2	
EW-20B b	"	"	9/4/01	12	110.0	18.0	110.0	100.0	17.0	95.0	Pass	1	

Notes:

1. Lift 1 indicates the first 6" clay layer placed, Lift 2 indicates the second 6" clay layer placed, Lift 3 indicates the third 6" clay layer placed. In areas where one lift was required, for example, the lift has been designated as Lift 1.

* = These sampling locations were not surveyed. Coordinates given are approximations.

a,b, etc. = Multiple tests were taken in the same area. Generally, a test was taken for each 6 inch lift of clay added

" = Same coordinates as above

Unless otherwise noted, all testing locations have been surveyed using a Global Positioning System (GPS) unit

Tests which did not yield passing results were not recorded. Instead, the clay was reworked and retested until a passing results was obtained.

Table 6
Depth of Clay Added During Installation of Interim Engineered Cover
ACS NPL Site
Griffith, Indiana

Survey Control Point[1]	Area of Site	North Coordinate	East Coordinate	Original Elevation, feet	Elevation of Top of Clay, feet	Depth of Placed Clay, inches	Minimum Depth of Existing Clay[2], inches	Total Depth of Clay, inches	Design Depth of Clay, inches	Pass/Fail
1	Soil Cover	6375	5617	640.1	641.7	19.2	8.0	27.2	18.0	Pass
3	Soil Cover	6320	5678	643.8	644.7	10.8	8.0	18.8	18.0	Pass
4	Soil Cover	6432	5430	638.6	640.3	20.4	0.0	20.4	18.0	Pass
5	Soil Cover	6393	5494	638.9	640.6	20.4	0.0	20.4	18.0	Pass
6	Soil Cover	6365	5558	639.7	640.6	10.8	8.0	18.8	18.0	Pass
8	Soil Cover	6356	5598	645.4	646.3	10.8	8.0	18.8	18.0	Pass
9	Soil Cover	6267	5640	645.1	646.0	10.8	8.0	18.8	18.0	Pass
14	Soil Cover	6287	5571	645.4	646.3	10.8	8.0	18.8	18.0	Pass
17	FML Cover	6307	5481	640.2	641.0	9.6	8.0	17.6	12.0	Pass
19	FML Cover	6341	5418	644.5	645.5	12.0	8.0	20.0	12.0	Pass
27	Soil Cover	6244	5521	640.0	641.0	12.0	8.0	20.0	18.0	Pass
29	Soil Cover	6235	5564	645.6	646.5	10.8	8.0	18.8	18.0	Pass
31	Soil Cover	6205	5633	646.1	647.0	10.8	8.0	18.8	18.0	Pass
34	Soil Cover	6126	5600	647.1	647.9	9.6	10.0	19.6	18.0	Pass
35	Soil Cover	6411	5689	640.3	641.5	14.4	8.0	22.4	18.0	Pass
36	Soil Cover	6155	5530	643.1	644.0	10.8	8.0	18.8	18.0	Pass
39	Soil Cover	6047	5555	647.6	648.5	10.8	8.0	18.8	18.0	Pass
40	Soil Cover	6074	5505	645.3	646.1	9.6	10.0	19.6	18.0	Pass
41	Soil Cover	6100	5424	642.0	642.9	10.8	8.0	18.8	18.0	Pass
43	FML Cover	6169	5335	646.3	647.2	10.8	8.0	18.8	12.0	Pass
45	FML Cover	6076	5291	647.3	647.8	6.0	8.0	14.0	12.0	Pass
48	FML Cover	5917	5216	647.9	648.9	12.0	0.0	12.0	12.0	Pass
50	FML Cover	5890	5283	648.2	649.3	13.2	0.0	13.2	12.0	Pass
54	Soil Cover	5846	5437	648.7	650.2	18.0	0.0	18.0	18.0	Pass
56	Soil Cover	5904	5486	647.1	648.6	18.0	0.0	18.0	18.0	Pass
57	Soil Cover	5986	5490	646.3	648.0	20.4	8.0	28.4	18.0	Pass
58	Soil Cover	5898	5390	648.5	650.1	19.2	0.0	19.2	18.0	Pass
59	Soil Cover	5836	5392	650.3	651.8	18.0	0.0	18.0	18.0	Pass
60	Soil Cover	5957	5392	646.9	647.9	12.0	8.0	20.0	18.0	Pass
61	FML Cover	5796	5376	651.0	652.5	18.0	0.0	18.0	12.0	Pass
62	Soil Cover	5988	5396	645.1	646.1	12.0	8.0	20.0	18.0	Pass
63	Soil Cover	5736	5378	650.4	652.3	22.8	0.0	22.8	18.0	Pass
66	Soil Cover	6030	5409	644.3	645.3	12.0	8.0	20.0	18.0	Pass
71	FML Cover	5825	5312	650.4	651.4	12.0	0.0	12.0	12.0	Pass
72	FML Cover	5766	5321	650.6	651.6	12.0	0.0	12.0	12.0	Pass
73	FML Cover	5706	5312	651.9	652.9	12.0	0.0	12.0	12.0	Pass
75	FML Cover	5683	5312	651.0	652.4	16.8	0.0	16.8	NA	NA
77	FML Cover	5838	5267	648.0	649.1	13.2	0.0	13.2	12.0	Pass
78	FML Cover	5761	5254	650.3	651.4	13.2	0.0	13.2	12.0	Pass
80	FML Cover	5793	5205	649.4	650.6	14.4	0.0	14.4	12.0	Pass
81	FML Cover	5853	5209	648.3	649.4	13.2	0.0	13.2	12.0	Pass
82	FML Cover	5807	5133	649.9	650.9	12.0	0.0	12.0	12.0	Pass
83	FML Cover	5864	5148	648.6	649.8	14.4	0.0	14.4	12.0	Pass

Table 6
Depth of Clay Added During Installation of Interim Engineered Cover
ACS NPL Site
Griffith, Indiana

Survey Control Point[1]	Area of Site	North Coordinate	East Coordinate	Original Elevation, feet	Elevation of Top of Clay, feet	Depth of Placed Clay, inches	Minimum Depth of Existing Clay[2], inches	Total Depth of Clay, inches	Design Depth of Clay, inches	Pass/Fail
85	FML Cover	5869	5108	648.0	649.1	13.2	0.0	13.2	12.0	Pass
86	FML Cover	5817	5057	645.2	646.3	13.2	0.0	13.2	12.0	Pass
90	FML Cover	5834	5016	643.5	645.8	27.6	0.0	27.6	12.0	Pass
91	FML Cover	5878	5046	643.6	644.7	13.2	0.0	13.2	12.0	Pass
94	FML Cover	5722	5015	646.8	648.0	14.4	0.0	14.4	12.0	Pass
95	FML Cover	5681	5057	648.3	648.7	4.8	0.0	4.8	NA	NA
96	FML Cover	5749	5062	648.5	649.6	13.2	0.0	13.2	12.0	Pass
97	FML Cover	5678	5119	649.4	649.8	4.8	0.0	4.8	NA	NA
98	FML Cover	5746	5122	650.1	651.3	14.4	0.0	14.4	12.0	Pass
100	FML Cover	5744	5188	650.7	651.7	12.0	0.0	12.0	12.0	Pass
101	FML Cover	5973	5191	644.7	645.8	13.2	0.0	13.2	12.0	Pass
104	FML Cover	5978	5107	645.1	646.3	14.4	0.0	14.4	12.0	Pass
105	FML Cover	5679	5198	649.9	651.1	14.4	0.0	14.4	12.0	Pass
106	FML Cover	6017	5020	641.0	641.7	8.4	0.0	8.4	NA	NA
107	FML Cover	6069	5020	640.0	641.2	14.4	0.0	14.4	12.0	Pass
109	FML Cover	6042	5103	643.2	644.1	10.8	2.0	12.8	12.0	Pass
111	FML Cover	6032	5148	644.5	645.7	14.4	0.0	14.4	12.0	Pass
112	FML Cover	6026	5198	647.9	648.2	3.6	10.0	13.6	12.0	Pass
113	FML Cover	5924	5154	647.0	648.1	13.2	0.0	13.2	12.0	Pass
115	FML Cover	5935	5085	645.0	646.1	13.2	0.0	13.2	12.0	Pass
116	FML Cover	5928	5051	643.7	644.9	14.4	0.0	14.4	12.0	Pass
117	FML Cover	6096	5246	648.5	649.0	6.0	8.0	14.0	12.0	Pass
119	FML Cover	6120	5137	644.2	645.1	10.8	8.0	18.8	12.0	Pass
120	FML Cover	6146	5092	641.5	642.6	13.2	0.0	13.2	12.0	Pass
122	FML Cover	6178	5154	645.0	646.3	15.6	8.0	23.6	12.0	Pass
124	FML Cover	6161	5049	637.9	639.9	24.0	0.0	24.0	12.0	Pass
126	FML Cover	6212	5087	639.9	640.8	10.8	2.0	12.8	12.0	Pass
132	FML Cover	6230	5171	645.3	646.3	12.0	0.0	12.0	12.0	Pass
133	FML Cover	6279	5130	639.0	640.0	12.0	0.0	12.0	12.0	Pass
134	FML Cover	6267	5162	644.0	645.0	12.0	0.0	12.0	12.0	Pass
135	FML Cover	6251	5204	645.9	646.6	8.4	8.0	16.4	12.0	Pass
136	FML Cover	6242	5236	647.2	647.6	4.8	8.0	12.8	12.0	Pass
138	FML Cover	6207	5395	645.7	646.3	7.2	8.0	13.2	12.0	Pass
141	FML Cover	6285	5342	645.9	646.4	6.0	8.0	14.0	12.0	Pass
151	FML Cover	6375	5145	635.7	637.2	18.0	0.0	18.0	12.0	Pass
158	FML Cover	6421	5152	635.8	637.1	15.6	0.0	15.6	12.0	Pass
160	Soil Cover	5679	5375	650.9	652.5	19.2	0.0	19.2	18.0	Pass
164	Soil Cover	6448	5294	639.8	642.1	27.6	0.0	27.6	18.0	Pass
165	Soil Cover	6467	5204	637.7	639.3	19.2	0.0	19.2	18.0	Pass
166	Soil Cover	6645	5114	636.9	638.4	18.0	0.0	18.0	18.0	Pass
168	Soil Cover	6537	5156	636.9	638.4	18.0	0.0	18.0	18.0	Pass
169	Soil Cover	6629	5151	637.4	639.1	20.4	0.0	20.4	18.0	Pass
171	Soil Cover	6538	5329	637.3	639.1	21.6	0.0	21.6	18.0	Pass
172	Soil Cover	6528	5229	637.6	639.3	20.4	0.0	20.4	18.0	Pass

Table 6
Depth of Clay Added During Installation of Interim Engineered Cover
ACS NPL Site
Griffith, Indiana

Survey Control Point[1]	Area of Site	North Coordinate	East Coordinate	Original Elevation, feet	Elevation of Top of Clay, feet	Depth of Placed Clay, inches	Minimum Depth of Existing Clay[2], inches	Total Depth of Clay, inches	Design Depth of Clay, inches	Pass/Fail
173	Soil Cover	6495	5412	637.0	639.0	24.0	0.0	24.0	18.0	Pass
174	Soil Cover	6486	5345	636.7	6388.8	25.2	0.0	25.2	18.0	Pass
175	Soil Cover	6209	5487	640.1	641.0	10.8	8.0	18.8	18.0	Pass
176	FML Cover	6137	5393	643.5	644.2	8.4	8.0	16.4	12.0	Pass
177	Soil Cover	6147	5473	640.6	641.7	13.2	8.0	21.2	18.0	Pass
178	FML Cover	6053	5350	645.2	645.6	4.8	8.0	12.8	12.0	Pass
179	FML Cover	5967	5323	647.3	647.8	6.0	8.0	14.0	12.0	Pass
183	Soil Cover	6453	5504	638.7	640.2	18.0	0.0	18.0	18.0	Pass
184	FML Cover	6368	5329	644.5	645.1	7.2	8.0	15.2	12.0	Pass
185	FML Cover	6358	5291	643.3	644.4	13.2	8.0	21.2	12.0	Pass
186	FML Cover	6403	5276	641.9	643.0	13.2	0.0	21.2	12.0	Pass
187	FML Cover	6414	5230	639.0	640.2	14.4	0.0	14.4	12.0	Pass
188	FML Cover	6368	5212	637.6	639.4	21.6	0.0	21.6	12.0	Pass
189	FML Cover	6290	5272	644.1	645.4	15.6	8.0	23.6	12.0	Pass
190	FML Cover	6315	5193	640.4	641.5	13.2	0.0	13.2	12.0	Pass
191	Soil Cover	6585	5238	638.0	639.6	19.2	0.0	19.2	18.0	Pass
193	FML Cover	6174	5248	647.9	648.6	8.4	8.0	16.4	12.0	Pass
194	Soil Cover	6406	5387	643.9	645.7	21.6	0.0	21.6	18.0	Pass
195	Soil Cover	6335	5697	641.1	642.1	12.0	8.0	20.0	18.0	Pass
196	Soil Cover	6430	5581	639.6	641.1	18.0	0.0	18.0	18.0	Pass
197	Soil Cover	5777	5437	649.8	651.6	21.6	0.0	21.6	18.0	Pass
198	Soil Cover	5829	5478	648.7	650.4	20.4	0.0	20.4	18.0	Pass

Notes:

1. Survey Control Point Locations are shown on Figure 9
2. Conservative estimates of minimum existing clay depth were used to generalize large areas of the Off-Site Area for construction purposes. More precise estimates, based on field data as depicted in Figure 6, have been used as necessary in some areas.

NA = Not applicable. Tested location is outside of the perimeter barrier wall and is not part of the interim engineered cover.

Data contained in this table is from S&H Surveyors and Koester Environmental Services

FIGURES

LOCATION OF SEPARATION BARRIER WALL

SOIL COVER AREA

SOIL COVER AREA

FML COVER AREA

EW 20B

EW 20

EW-19A

EW-13A

646 642 644 640 638 636 634 632 652 650 648

LEGEND:

- BWES TRENCHES
- PERIMETER BARRIER WALL
- DELINEATION OF FML COVER
- SEPARATION BARRIER WALL
- EW 1 — EXTRACTION WELL OR CLEANOUT
- EXISTING CONTOURS

NOTES:

1. BASELINE TOPOGRAPHY FROM FINAL REMEDY (AUGUST 1999), SHEET C-3.
2. THE FML COVER AREA AND SOIL COVER AREA BOUNDARY LINES DEPICTED ON THIS FIGURE HAVE BEEN MODIFIED FROM THE FINAL REMEDY TO INCLUDE THE ACTUAL EXTENTS OF THE CONSOLIDATED SPOILS PILES.

0 100

SCALE IN FEET

REV	DATE	BY	DESCRIPTION

SCALE: 1" = 100'-0"

DESIGNED

DRAWN

CHECKED

SUBMITTED BY

(PROJECT MANAGER) LICENSE NO. DATE

(COMPANY OFFICER) LICENSE NO. DATE

MWH
MONTGOMERY WATSON HARZA

THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

BASELINE TOPOGRAPHY OF OFF-SITE AREA BEFORE FINAL GRADING

FIGURE 1

JOB NO. MW Job # File: J:/209/0601 ACS/1C7/area_c/c_complet~1/report/f_g_1_topo_bef_fnl_grd.DWG

LOCATION OF SEPARATION BARRIER WALL

PLACEMENT OF HAYBALES

DETENTION POND

POND BASE ELEV. 632.2

CONSTRUCTION OF DETENTION POND

INSTALLATION OF SILT FENCING

LEGEND:

- PERIMETER BARRIER WALL
- DELINEATION OF FML COVER
- SEPARATION BARRIER WALL
- HAYBALES
- CHAIN LINK FENCE
- SILT FENCE

0 100

SCALE IN FEET

REV	DATE	BY	DESCRIPTION

SCALE: 1" = 100'-0"

DESIGNED

DRAWN

CHECKED

SUBMITTED BY

(PROJECT MANAGER) LICENSE NO DATE

(COMPANY OFFICER) LICENSE NO DATE

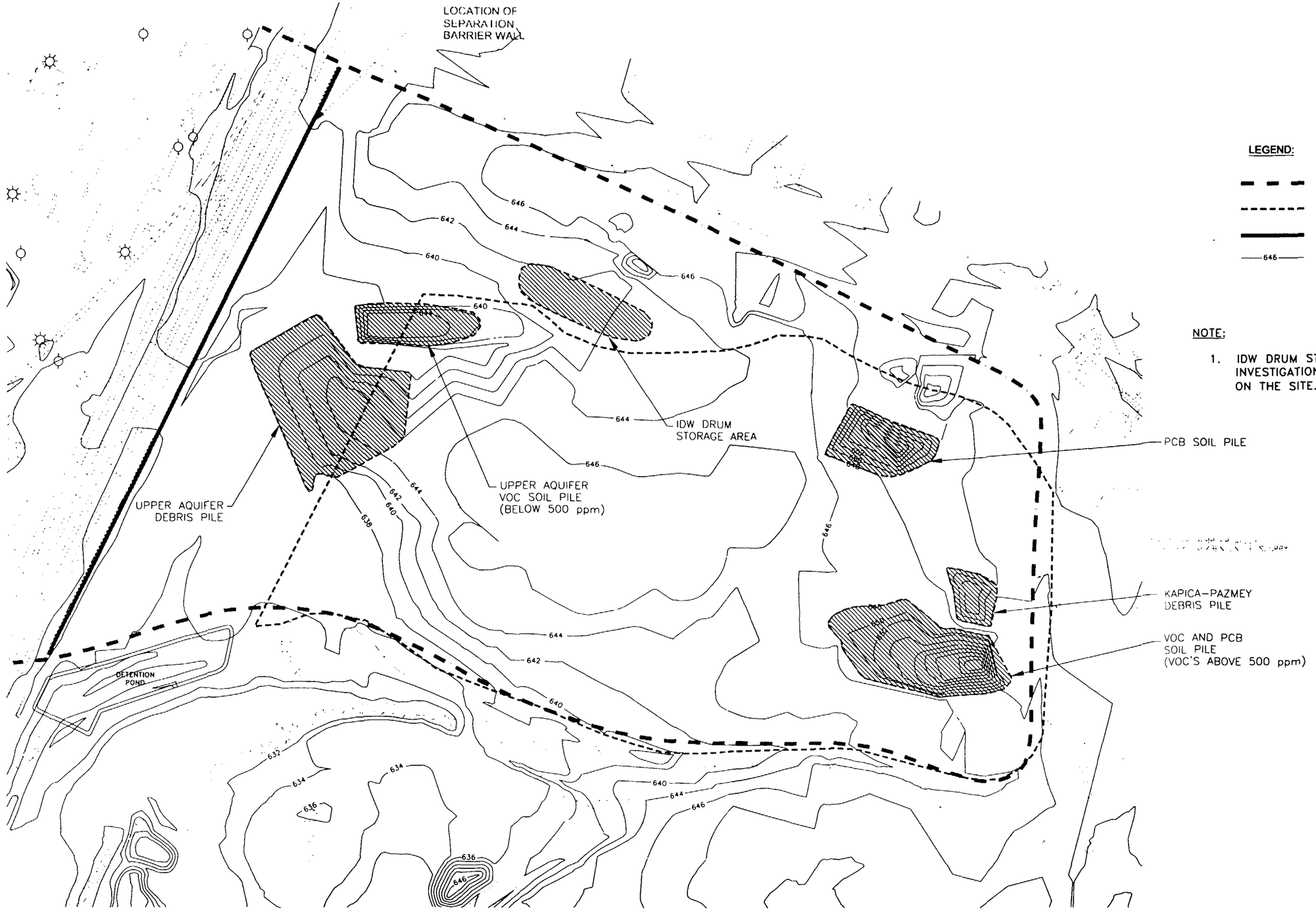
MWH
MONTGOMERY WATSON HARZA

THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) ACTIVITIES

FIGURE 2

Job No. Mw File J:/209/0601 ACS/107/drawing/completion report/f_g_2_SWPPP.DWG



REV	DATE	BY	DESCRIPTION	SCALE		SUBMITTED BY				
				1" = 100'-0"	DESIGNED	(PROJECT MANAGER)	LICENSE NO.	DATE	MWH MONTGOMERY WATSON HARZA	THE OFF-SITE AREA INTERIM ENGINEERED COVER CONSTRUCTION COMPLETION REPORT AMERICAN CHEMICAL SERVICE SUPERFUND SITE GRIFFITH, INDIANA
					DRAWN					
					CHECKED	(COMPANY OFFICER)	LICENSE NO.	DATE		

PREEXISTING LOCATIONS OF SPOILS PILES AND IDW DRUMS IN OFF-SITE AREA

FIGURE 3

Job No. MW Job # File J:\209\0601 ACS\107\draw ng\comp_et_gr report\Fig_3_exca_spoils.DWG

LOCATION OF
SEPARATION
BARRIER WALL

CONSOLIDATED
UPPER AQUIFER
VOC SOIL PILE
(BELOW 500 ppm)

REGRADED PCB
SOIL PILE

IDW SHEARED
DEBRIS PILE

KAPICA-PAZMEY
SHEARED DEBRIS PILE

CONSOLIDATED
UPPER AQUIFER
DEBRIS PILE

REGRADED VOC
AND PCB SOIL PILE

DETENTION
POND

EW-20C
EW-20B
EW-20A
EW-20
EW-19
EW-19A
EW-17A

LEGEND:

- BWES TRENCHES
- PERIMETER BARRIER WALL
- DELINEATION OF FML COVER
- SEPARATION BARRIER WALL
- EW-1 EXTRACTION WELL OR CLEANOUT

N

0 100

SCALE IN FEET

REV	DATE	BY	DESCRIPTION

SCALE: 1" = 100'-0"

DESIGNED _____
DRAWN _____
CHECKED _____

SUBMITTED BY
(PROJECT MANAGER) LICENSE NO. DATE
(COMPANY OFFICER) LICENSE NO. DATE

MWH
MONTGOMERY WATSON HARZA

THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

SPOILS PILES LOCATION IN OFF-SITE AREA
AFTER CONSOLIDATION AND REGRADING

FIGURE
4

JOB NO. MW Job # File J:/209/0601 ACS/107/area-ng/completion report/Fig_4_consolidated_spo.ls DWG

LOCATION OF
SEPARATION
BARRIER WALL

DETENTION
POND

EW-20C
EW-20B
EW-20A
EW-20
EW-19
EW-9A
CO-19
EW-13A

645 644 643 642 641 640 639 638 647 646 648 649 650 651

LEGEND:

- DELINEATION OF FML COVER
- BWES TRENCHES
- BARRIER WALL
- SEPARATION BARRIER WALL
- EW-1 EXTRACTION WELL OR CLEANOUT
- 648 BASELINE CONTOUR

NOTE:

1. BASELINE TOPOGRAPHY BASE ON SURVEY BY S&H SURVEYORS, JULY 31, 2001.
2. BASELINE TOPOGRAPHY SHOWN IS PRIOR TO PLACEMENT OF INTERIM ENGINEERED COVER.

0 100
SCALE IN FEET

File: J:/209/0601 ACS/107/drawing/completion report/fig_5_after_final_grading.DWG
Job No. MW Job #

REV	DATE	BY	DESCRIPTION

SCALE 1" = 100'-0"

DESIGNED
DRAWN
CHECKED

SUBMITTED BY
(PROJECT MANAGER) LICENSE NO DATE
(COMPANY OFFICER) LICENSE NO DATE

MWH
MONTGOMERY WATSON HARZA

THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

BASELINE TOPOGRAPHY OF
OFF-SITE AREA AFTER FINAL GRADING

FIGURE
5

LOCATION OF SEPARATION BARRIER WALL

AREA 5

AREA 4

AREA 1

AREA 2

AREA 3

DETENTION POND

12″ 15″ 13″ 5″ 12″ 15″ 13″ 14″ 14″ 5″ 7″ 14″ 8″ 8. 5″ 13″ 8″ 7″ 12″ 15″ 14″ 8″ 4. 5″ 7″ 14″ 6″ 12″ 8″ 12″ 10″ 0″ 0″ 15″ 12″ 12″ 14″ 15″ 14″ SOFT 6″SOFT 6. 5″ 6″ 8″ 8″ 12″ 10″ 8″ 10″ 10″ 4″ 0″ 13″

LEGEND:

- BWES TRENCHES
- PERIMETER BARRIER WALL
- DELINEATION OF FML COVER
- SEPARATION BARRIER WALL
- AREA 1 — AREA DIVISIONS USED DURING CONSTRUCTION ACTIVITIES. DIVISIONS BASED ON SIMILAR COVER CONDITIONS.
- EXISTING CLAY THICKNESS ACCORDING TO FIELD ANALYSIS

NOTE:

1. AREA OUTSIDE FML COVER AREA TO BE SUPPLEMENTED WITH CLAY SO THAT TOTAL CLAY THICKNESS IS 18".

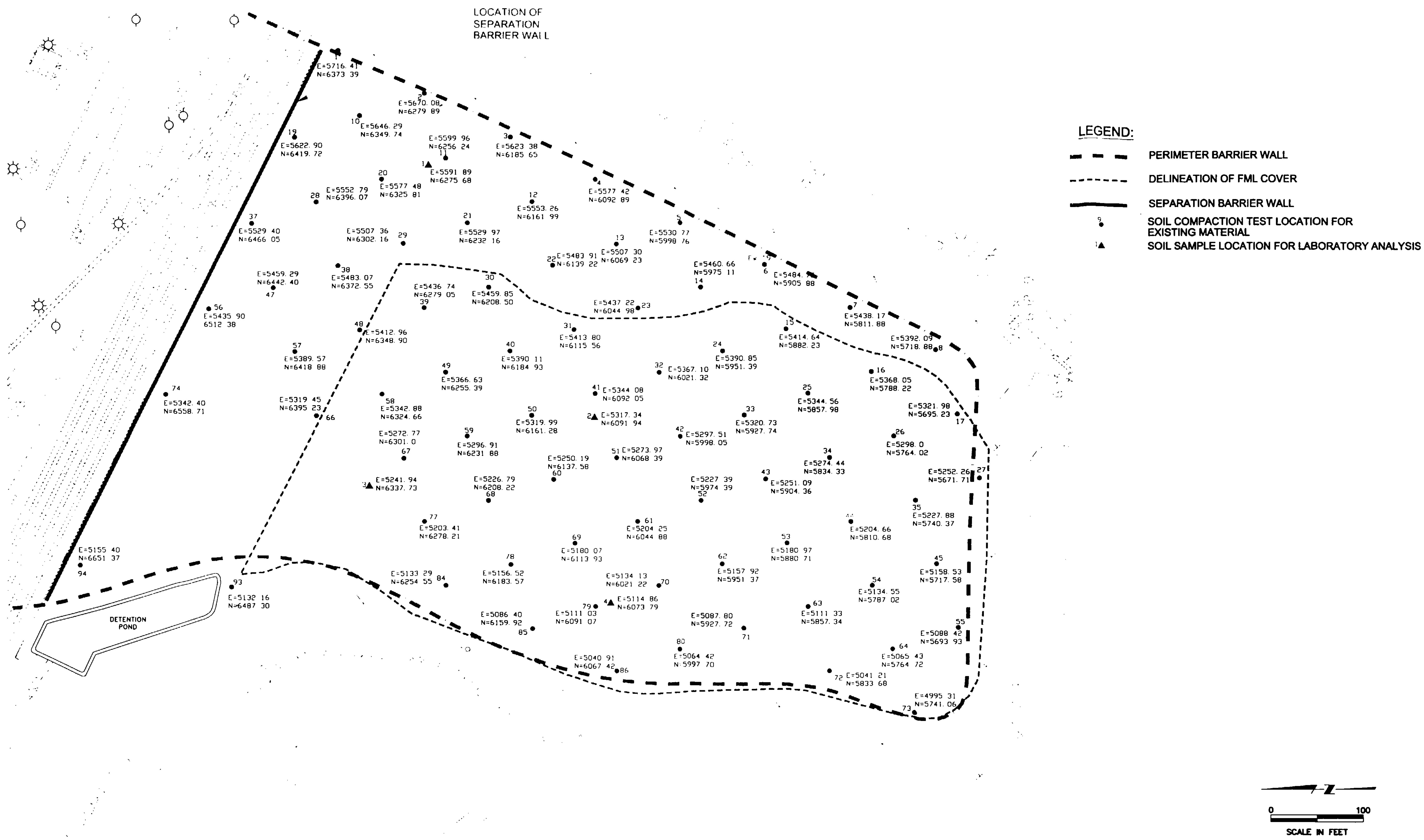
N

0 100

SCALE IN FEET

REV	DATE	BY	DESCRIPTION	SCALE	DESIGNED	DRAWN	CHECKED	SUBMITTED BY (PROJECT MANAGER) LICENSE NO DATE (COMPANY OFFICER) LICENSE NO DATE	MWH	THE OFF-SITE AREA INTERIM ENGINEERED COVER CONSTRUCTION COMPLETION REPORT AMERICAN CHEMICAL SERVICE SUPERFUND SITE GRIFFITH, INDIANA	EXISTING CLAY THICKNESS IN OFF-SITE AREA PRIOR TO PLACEMENT OF INTERIM ENGINEERED COVER	FIGURE 6
				1" = 100'-0"								

J:\209\0601 ACS\0107 Temp Off Site Cover\drawings\Completion Report\fig_6_exist_clay_befor_cov.dwg


LOCATION OF SEPARATION BARRIER WALL
LEGEND:
PERIMETER BARRIER WALL
DELINEATION OF FML COVER
SEPARATION BARRIER WALL
SOIL COMPACTION TEST LOCATION FOR EXISTING MATERIAL
SOIL SAMPLE LOCATION FOR LABORATORY ANALYSIS
DETENTION POND
1 E=5716. 41 N=6373 39
2 E=5670. 08 N=6279 89
3 E=5623 38 N=6185 65
4 E=5577 42 N=6092 89
5 E=5530 77 N=5998 76
6 E=5484. 98 N=5905 88
7 E=5438. 17 N=5811. 88
8 E=5392. 09 N=5718. 88
10 E=5646. 29 N=6349. 74
11 E=5599 96 N=6256 24
1 E=5591 89 N=6275 68
12 E=5553. 26 N=6161 99
13 E=5507 30 N=6069 23
14 E=5460. 66 N=5975 11
15 E=5414. 64 N=5882. 23
16 E=5368. 05 N=5788. 22
17 E=5321. 98 N=5695. 23
19 E=5622. 90 N=6419. 72
20 E=5577 48 N=6325 81
21 E=5529 97 N=6232 16
22 E=5483 91 N=6139 22
23 E=5437 22 N=6044 98
24 E=5390. 85 N=5951. 39
25 E=5344. 56 N=5857. 98
26 E=5298. 0 N=5764. 02
27 E=5252. 26 N=5671. 71
28 E=5552 79 N=6396. 07
29 E=5507 36 N=6302. 16
30 E=5459. 85 N=6208. 50
31 E=5413 80 N=6115 56
32 E=5367. 10 N=6021. 32
33 E=5320. 73 N=5927. 74
34 E=5274. 44 N=5834. 33
35 E=5227. 88 N=5740. 37
37 E=5529 40 N=6466 05
38 E=5483. 07 N=6372. 55
39 E=5436 74 N=6279 05
40 E=5390 11 N=6184 93
41 E=5344 08 N=6092 05
2 E=5317. 34 N=6091 94
42 E=5297. 51 N=5998. 05
43 E=5251. 09 N=5904. 36
44 E=5204. 66 N=5810. 68
45 E=5158. 53 N=5717. 58
47 E=5459. 29 N=6442. 40
48 E=5412. 96 N=6348. 90
49 E=5366. 63 N=6255. 39
50 E=5319. 99 N=6161. 28
51 E=5273. 97 N=6068 39
52 E=5227 39 N=5974 39
53 E=5180 97 N=5880 71
54 E=5134. 55 N=5787 02
55 E=5088 42 N=5693 93
56 E=5435 90 6512 38
57 E=5389. 57 N=6418 88
58 E=5342. 88 N=6324. 66
59 E=5296. 91 N=6231 88
60 E=5250. 19 N=6137. 58
61 E=5204 25 N=6044 88
62 E=5157 92 N=5951 37
63 E=5111 33 N=5857. 34
64 E=5065 43 N=5764 72
66 E=5319 45 N=6395 23
67 E=5272. 77 N=6301. 0
3 E=5241. 94 N=6337. 73
68 E=5226. 79 N=6208. 22
69 E=5180 07 N=6113 93
70 E=5134 13 N=6021 22
71 E=5087. 80 N=5927. 72
72 E=5041 21 N=5833 68
73 E=4995 31 N=5741. 06
74 E=5342. 40 N=6558. 71
77 E=5203. 41 N=6278. 21
78 E=5156. 52 N=6183. 57
79 E=5111 03 N=6091 07
4 E=5114 86 N=6073 79
80 E=5064 42 N=5997 70
84 E=5133 29 N=6254 55
85 E=5086 40 N=6159. 92
86 E=5040 91 N=6067 42
93 E=5132 16 N=6487 30
94 E=5155 40 N=6651 37
0 100
SCALE IN FEET

REV	DATE	BY	DESCRIPTION

SCALE 1" = 100'-0"

DESIGNED
DRAWN
CHECKED

SUBMITTED BY
(PROJECT MANAGER) LICENSE NO DATE
(COMPANY OFFICER) LICENSE NO DATE

MWH MONTGOMERY WATSON HARZA

THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

OFF-SITE AREA
INITIAL SOIL TESTING LOCATIONS

FIGURE 7

LOCATION OF
SEPARATION
BARRIER WALL

DETENTION
POND

LEGEND:

- PERIMETER BARRIER WALL
- DELINEATION OF FML COVER
- SEPARATION BARRIER WALL
- 99● SOIL COMPACTION TEST LOCATION (a,b,c - MULTIPLE TESTS WERE TAKEN IN THE SAME AREA)

NOTE:

1. TESTING LOCATIONS BASED ON GPS SURVEY BY MWH, AUGUST/SEPTEMBER 2001.
2. GENERALLY, A TEST WAS TAKEN FOR EACH 6" LIFT OF CLAY ADDED.
3. TESTING LOCATION COORDINATES ARE LISTED IN TABLE 2.

N

0 100

SCALE IN FEET

File J:/209/0601 ACS/107/drawing/f g-8_clay_cover_comp_test.DWG
MW Job No.

REV	DATE	BY	DESCRIPTION

SCALE: 1" = 100'-0"

DESIGNED ____ DRAWN ____ CHECKED ____

SUBMITTED BY
(PROJECT MANAGER) LICENSE NO DATE
(COMPANY OFFICER) LICENSE NO DATE

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CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

OFF-SITE AREA
CLAY COVER COMPACTION TESTING LOCATIONS

FIGURE
8

LOCATION OF
SEPARATION
BARRIER WALL

DETENTION
POND

EW-20C
EW-20B
EW-20A
EW-20
EW-19
EW-19A
EW-13A
CO-19

LEGEND:

- BWES TRENCHES
- PERIMETER BARRIER WALL
- SEPARATION BARRIER WALL
- LW 1 — EXTRACTION WELL OR CLEANOUT
- 648 — CONTOUR OF TOP OF CLAY LAYER
- X73 — SURVEY CONTROL POINT

NOTE:

1. CLAY TOPOGRAPHY BASED ON SURVEY BY S&H SURVEYORS, AUGUST 29, 2001.
2. CLAY PLACED BY KOESTER ENVIRONMENTAL SERVICE, JULY/AUGUST 2001.

0 100
SCALE IN FEET

REV	DATE	BY	DESCRIPTION

SCALE 1" = 100'-0"

DESIGNED
DRAWN
CHECKED

SUBMITTED BY
(PROJECT MANAGER) LICENSE NO DATE
(COMPANY OFFICER) LICENSE NO DATE

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THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

TOPOGRAPHY OF TOP OF CLAY COVER

FIGURE 9

Job No. KW Job # File: J:/209/0601 ACS/107/dgn:rg/completion report/fig 9 top of clay.dwg

LOCATION OF SEPARATION BARRIER WALL

SWALE 3

SWALE 4

SOIL FROM CONSTRUCTION OF WETLAND POND (NON-PCB IMPACTED), TREE TRUNKS, AND WOODCHIPS

SWALE 3

B FIG.11

EW-20C

EW-20B

1 FIG.11

SWALE 2

EW-19A

2 FIG.11

GRAVEL ACCESS ROAD

CO-1

EW-20A

BLOWER SHED

SWALE 1

TREE TRUNKS

EW-20

SWALE 4

SWALE 5

DETENTION POND

SWALE 1

A FIG.11

EW-13A

SWALE 1

LEGEND:

- BWES TRENCHES
- PERIMETER BARRIER WALL
- DELINEATION OF FML COVER
- SEPARATION BARRIER WALL
- EW-1 EXTRACTION WELL OR CLEANOUT
- GRASS
- CLAY - PROTECTED WITH EROSION MATTING AND SILT FENCE AS NEEDED
- DRAINAGE SWALE LINED WITH RIP RAP
- DRAINAGE SWALE LINED WITH EROSION MATTING
- DRAINAGE SWALE LINED WITH EROSION GRASS
- MATERIAL STAGING AREA

N

0 100

SCALE IN FEET

REV	DATE	BY	DESCRIPTION

SCALE: 1" = 100'-0"

DESIGNED

DRAWN

CHECKED

SUBMITTED BY

(PROJECT MANAGER) LICENSE NO. DATE

(COMPANY OFFICER) LICENSE NO. DATE

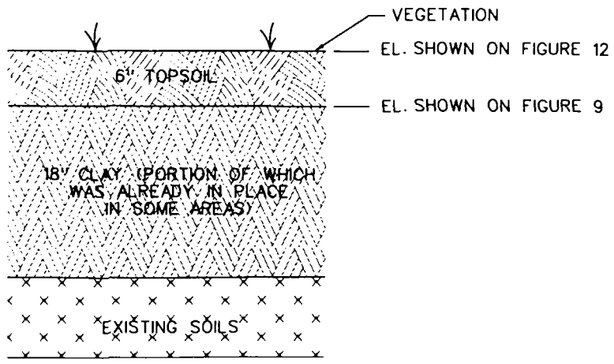
MWH MONTGOMERY WATSON HARZA

THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

AS-BUILT SUMMARY OF OFF-SITE AREA
INTERIM ENGINEERED COVER

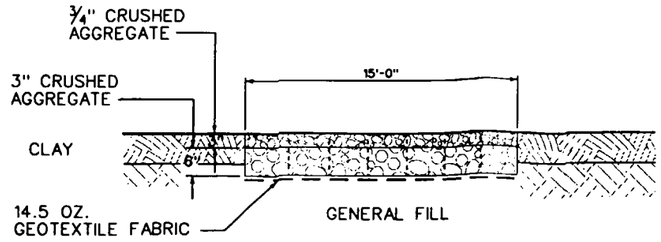
FIGURE 10

MW Job # File J:/209/0601 ACS/107/drawing/completion report/fig10_AS_BUILT_SUMMARY.DWG



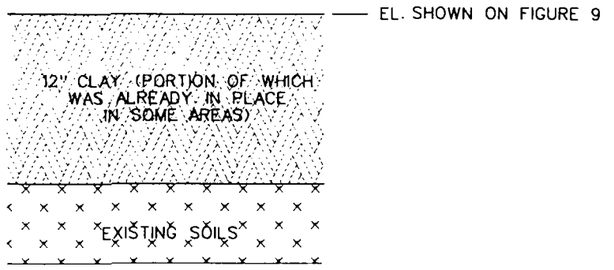
OFF-SITE AREA TYPICAL SOIL (OUTSIDE OF FML COVER AREA) — 1 FIGURE 10

NOT TO SCALE



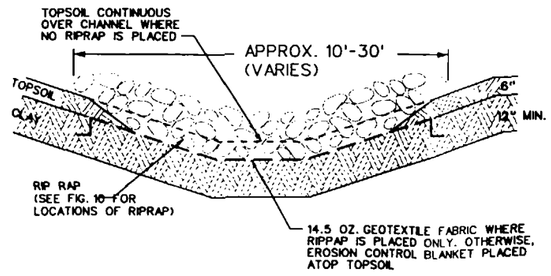
TYPICAL ACCESS ROAD SECTION — B FIGURE 10

NOT TO SCALE



OFF-SITE AREA TYPICAL SOIL (INSIDE OF FML COVER AREA) — 2 FIGURE 10

NOT TO SCALE



TYPICAL DRAINAGE SWALE OR CHANNEL — A FIGURE 10

NOT TO SCALE

Job No: MW Job # File: J:/209/0601 acs/0107/completion report/drawings/FIG_11_DETAILS.dgn Plot Date: 04-JUN-2002 08:29

REV	DATE	BY	DESCRIPTION

SCALE: NONE

DESIGNED RAA
DRAWN RBA
CHECKED TAB

SUBMITTED BY
(PROJECT MANAGER) LICENSE NO. DATE
(COMPANY OFFICER) LICENSE NO. DATE

MWH
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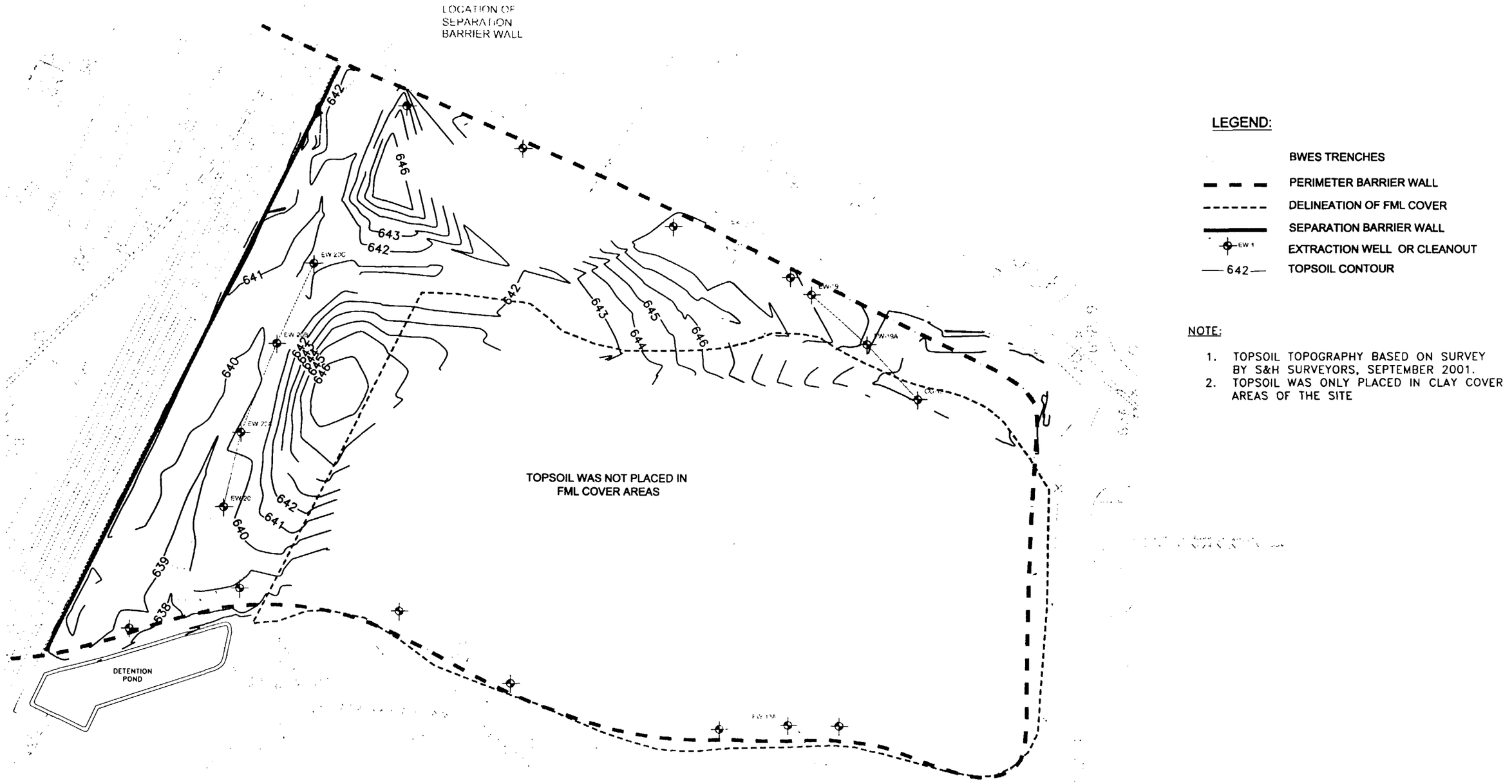
THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE, INC.
GRIFFITH, INDIANA

OFF-SITE AREA INTERIM
ENGINEERED COVER
SECTIONS AND DETAILS

FIGURE 11



REV	DATE	BY	DESCRIPTION

SCALE: 1" = 100'-0"

DESIGNED

DRAWN

CHECKED

SUBMITTED BY

(PROJECT MANAGER) LICENSE NO DATE

(COMPANY OFFICER) LICENSE NO DATE

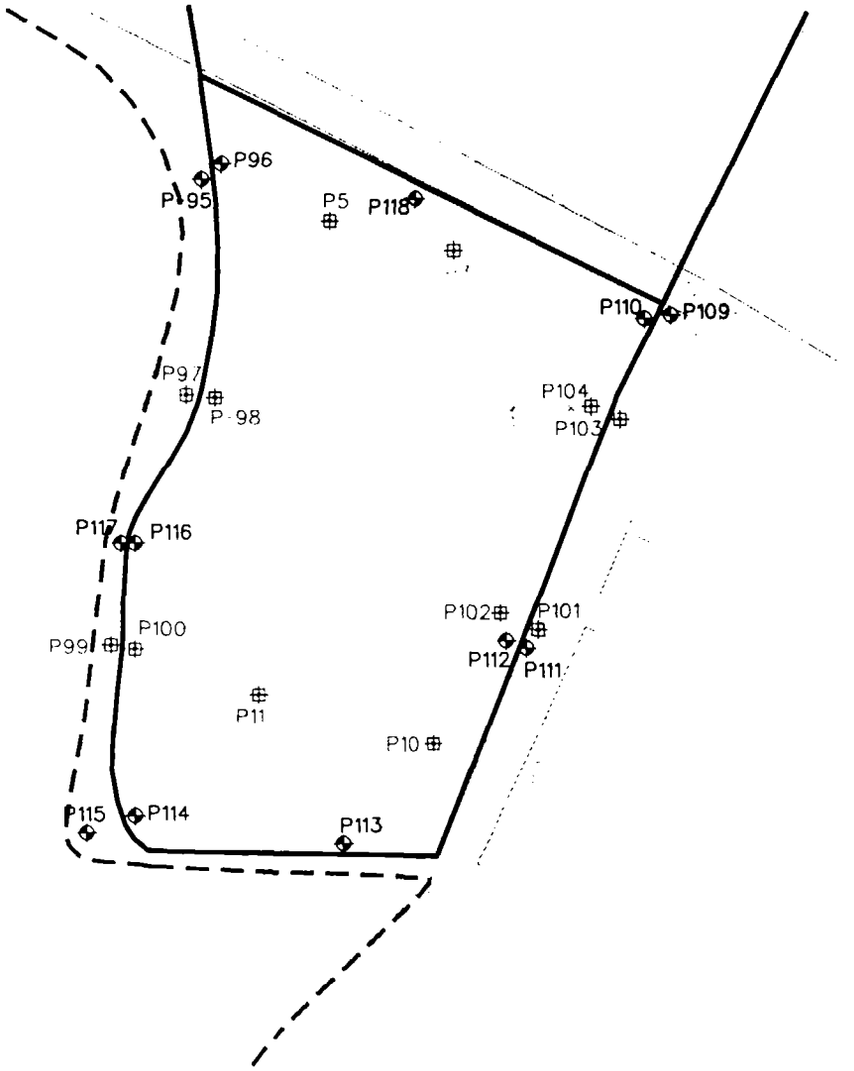
MWH
MONTGOMERY WATSON HARZA

THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE SUPERFUND SITE
GRIFFITH, INDIANA

TOPOGRAPHY OF FINAL TOPSOIL LAYER

FIGURE
12

Job No. "W Job # File J:/209/0601 ACS/107/drawing/completion report/fig_12_TOP_SOIL.DWG



LEGEND

P95 ◆ EXISTING PIEZOMETER LOCATION AND DESIGNATION

P3 ⊕ DESTROYED PIEZOMETER LOCATION AND DESIGNATION

SEPARATION OR PERIMETER BARRIER WALL

APPROXIMATE TOWN OF GRIFFITH PROPERTY BOUNDARY

N

0 250

SCALE IN FEET

REVISED NOVEMBER 2001

MWH
MONTGOMERY WATSON HARZA

THE OFF-SITE AREA
INTERIM ENGINEERED COVER
CONSTRUCTION COMPLETION REPORT
AMERICAN CHEMICAL SERVICE, INC.
GRIFFITH, INDIANA

PIEZOMETERS IN THE OFF-SITE AREA

FIGURE 13

FILE: J:/209/0601 acs/107/drawings/completion report/fig_13_piezometers.dgn

APPENDIX A

Chronological Summary of Construction Activities

CHRONOLOGICAL SUMMARY OF CONSTRUCTION ACTIVITIES

This section summarizes the Site activities related to the installation of the interim engineered cover in the Off-Site Area. Photographs summarizing Site activities are included in Appendix B.

Week of March 26, 2001
Dave's Tree Service, a tree removal subcontractor, began to clear and grub the Off-Site Area of trees and brush in anticipation of the installation of the interim engineered cover.

Week of April 2, 2001
Dave's Tree Service completed clearing and grubbing of Off-Site Area.

Week of April 23, 2001
Erosion control measures were installed in the Off-Site Area including silt fencing and hay bales.

Week of May 13, 2001
An environmental subcontractor, Midwest Environmental, Inc. (MEI), sheared IDW drummed waste and contents of the K-P waste pile into manageable pieces. MEI began construction of a detention pond in the northwest corner of the Off-Site Area.

Week of May 20, 2001
MEI sheared IDW drummed waste and contents of the K-P waste pile into manageable pieces. MEI completed the construction of the detention pond. The sheared debris was placed between the two piles of upper aquifer debris and soil in the north part of the Off-Site Area (See Figure 4).

Week of May 28, 2001
MEI began grading the Off-Site Area in preparation of future clay placement. The PCB and VOC soil spoils piles were regraded, consolidated, and covered with a short-term clay layer. MWH used GPS unit to survey the locations of the spoils piles located throughout the Off-Site Area. During regrading activities, piezometers P3, P10, P11, and P102 were abandoned.

Week of June 4, 2001
MEI continued grading the subbase, including rough shaping of future swales. MEI continued to add and compact clay over spoils pile areas.

Week of June 11, 2001
MEI completed the placement and compaction of clay over spoils pile areas. A third-party surveying subcontractor, Area Survey Company, conducted a baseline survey of Off-Site Area prior to placement of interim engineered cover.

A geotechnical testing subcontractor, Great Lakes Consultants, began initial compaction testing on existing clay, based on the testing grid established by MWH (see Figure 7). Compaction testing was performed with a nuclear density unit.

Week of June 18, 2001
Great Lakes continued initial compaction testing on existing clay. Great Lakes also collected four samples of existing Site clay at locations specified by MWH for analysis (see Figure 7).

Week of June 25, 2001
Great Lakes performed a preliminary compaction testing and clay thickness survey on former spoils piles areas which had been covered by an initial lift of clay.

Week of July 2, 2001
A Site walk meeting was held on July 3, 2001 for the installation of the interim engineered cover of the Off-Site Area.

Week of July 16, 2001
Koester Environmental Services (KES) was selected as the clay placement subcontractor to install the interim engineered cover. MWH and KES participated in a pre-construction teleconference meeting.

Week of July 23, 2001
KES and MWH participated in a construction kickoff and health and safety meeting on July 23, 2001 which outlined the schedule and work plan to be used. KES mobilized to the Site. KES personnel mobilized a tool trailer and completed a Site walk with MWH. A pre-construction meeting was held with MWH. It was determined that the stumps and trees would be stockpiled directly to the east of the engineered area. Preparation of the Site began by grading out rough areas and stockpiled soils in order to begin placing the clay cover.

Week of July 30, 2001
Site preparations continued for placement of the clay cover. The Site was graded and exposed trash consolidated to be later covered with clay. S&H Engineers, the surveyors retained by KES, completed a baseline Site survey and installed boundary stakes. The first loads of clay were brought to the Site for placement. Approximately 4,700 cubic yards of clay were placed in the Off-Site Area and graded during the week. Clay was placed and compacted in the non-engineered eastern portion of Area 1 so tree debris stockpiled in the middle of the Site could be moved as soon as possible. Clay was also placed and compacted in Areas 2 and 3. The drainage channels were laid out in the field in order to use natural swales and minimize the grading required prior to the placement of geotextile and rip rap material.

In order to meet moisture requirements for the clay, a fract tank was mobilized to the Site for storing water. Discharge from the GWTP was redirected to flow into the fract tank to add to the imported clay to aid in compaction.

Great Lakes began to conduct moisture and compaction tests on the newly placed and compacted clay as part of the project's quality control/quality assurance. Tests were performed in Area 1 and Area 3.

MWH conducted further investigations to determine the depth and usability of existing clay, especially in Area 3. MWH concluded that no usable clay existed in Area 3 and that the full 12 inches of clay would be placed over the HDPE/clay portion of that area. It was also concluded that Areas 4 and 5 contained no usable clay and that 18 inches of clay would be placed over these areas because they were located entirely in the Soil Cover area.

Week of August 6, 2001

Approximately 2,200 cubic yards of clay were placed on the Site this week. Placement of the initial lift of clay in Area 3 continued and final grading of clay began in Area 2. Great Lakes continued to perform compaction and moisture testing. Geotechnical testing results indicated that the in-place density requirements were achieved (greater than 95% maximum density) at all locations. However, the in-place moisture at several test locations was between 14.5% and 16.5%, which was less than the optimal moisture. The non-passing locations were reworked with a tractor and disc roller to break up the placed clay. A water truck, using treated discharge water from the GWTP, added moisture to the clay until the moisture requirements were met. These areas included Areas 1 and 2. Additional testing by Great Lakes confirmed that these areas had met the moisture and compaction requirements. Grade stakes were placed in Area 3 and clay placement commented in that area.

Off-Site Area piezometer P103 was removed by MWH and the hole filled with bentonite chips.

Week of August 13, 2001

Clay continued to be place in Area 3 up to the final grade. Approximately 2,700 cubic yards of clay were placed on the Site this week. Water continued to be added to the clay in order to meet the moisture requirement. Great Lakes continued to conduct compaction and moisture testing in the areas that had been completed. Clay was also added and geotechnically tested in the location of the future blower shed pad, near the intersection of Areas 1, 2, and 3.

Preparation of the drainage swales, primarily Swale 3, continued. Grading continued in the eastern portion of Area 1 to prepare for topsoil placement. Geotextile fabric began to be placed in the exterior drainage swales (Swale 1 and 3) in preparation for rip rap placement.

362 tons of rip rap were hauled to the Site and placed in the drainage swales along the east and west portions of the Site (Swale 1 and Swale 3).

The final grading was completed in the eastern portion of Area 1. Surveying was completed by S&H Engineers in the eastern portion of Area 1, confirming that it met the final grade. Topsoil was imported for placement on the east side of Area 1. Preparations were made to move the stockpiled stumps and wood chips to eastern portion of Site.

Piezometers P5, P97, P98, P99, P100, P101, and P104 were removed.

Week of August 20, 2001
Rain during the weekend and sporadically throughout the week hampered efforts to continue the completion of the clay cover. Grading continued in Areas 1, 2, and 3 and clay placement continued in Areas 1, 3, 4 and 5. Area 4 was graded and compacted. Approximately 2,800 cubic yards of clay were placed on the Site during this week. Final grading of Area 1 clay cover area was completed. S&H Engineers were on Site to complete surveying grades of placed clay. Relocation of the wood chips and tree stumps began. They were transported to the eastern portion of Area 1 on top of the completed clay.

Rip rap was delivered to complete the drainage channels along the west and southern portions of the Site (Swale 1) and to create a rip rap lined outfall point where the drainage channels enter the retention pond.

Week of August 27, 2001
Rain continued to limit field work. The remainder of clay was placed in Areas 1 and 2. Final grading of Areas 1 and 3 was performed, completing the final grading of clay in the Off-Site Area. S&H surveyed the final clay topography. All areas had passed clay compaction and moisture testing. Area Survey Company surveyed portions of the Off-Site Are for quality control purposes.

Topsoil began to be placed in portions of Area 1, 4, and 5. Approximately 2,200 cubic yards of topsoil were delivered to the Site during the week. Swale 4 was graded for proper drainage in order to meet the design requirements for stormwater runoff.

Week of September 3, 2001
Approximately 500 cubic yards of topsoil were delivered to the Site during the week. Final grading of topsoil was completed. Slusser Company, the seeding subcontractor of KES, completed seeding the topsoil areas and began to place erosion matting. MWH requested additional areas of erosion matting to be placed. MWH and KES created and began to complete a final punchlist for remaining tasks.

Week of September 9, 2001
Slusser Company placed additional erosion matting.

Week of September 16, 2001
Boart Longyear & Associates (BLA), the drilling subcontractor who installed the ISVE wells in the Off-Site Area, installed ten additional piezometers in the Off-Site Area. A gravel access road was constructed between the south gate of the Off-Site Area and the ISVE blower shed.

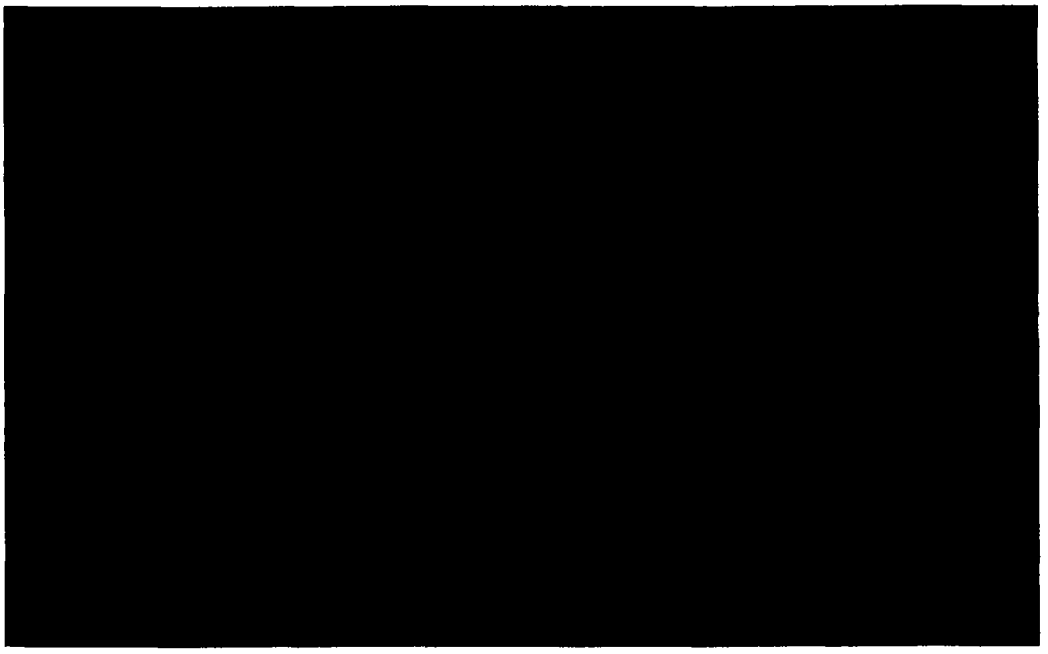
Week of October 7, 2001
Slusser Company completed placement of erosion matting.

APPENDIX B

Photographs

1. April 2001 (Looking West): Clearing and grubbing the Off-Site Area prior to the installation of the interim engineered cover.

2. May 2001 (Looking South): A shearer cuts Kapica-Pazmey spoil pile debris into smaller pieces during Spoils Pile Consolidation.



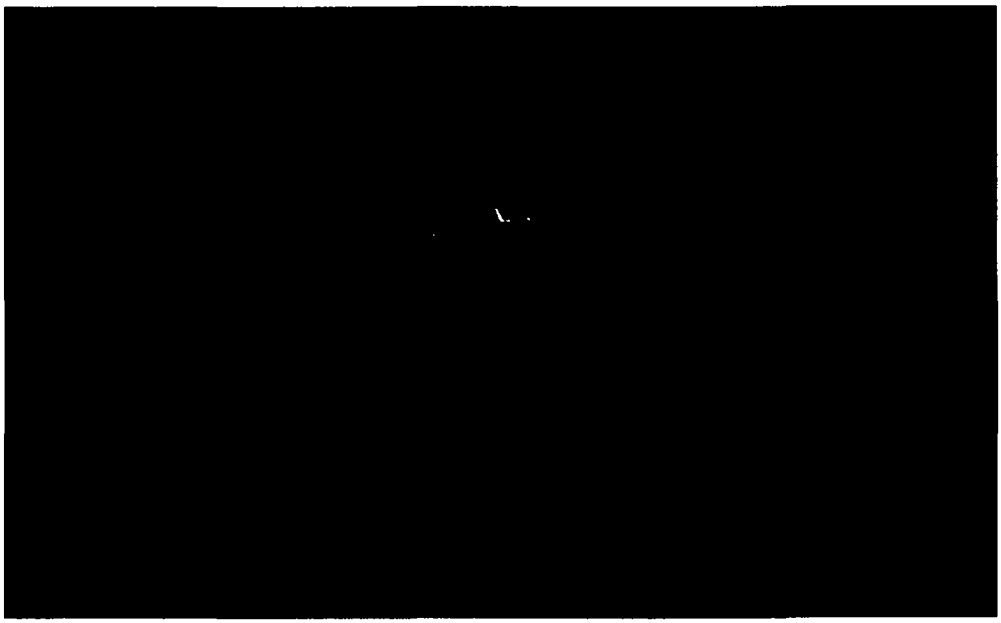
3. May 2001 (Looking North): The Off-Site Area, looking north, prior to the installation of the temporary engineered cover.

4. May 2001 (Looking North): The construction of the Detention Pond in the northwest corner of the Off-Site Area.

5. July 2001 (Looking Southwest): Investigating the depth and condition of existing clay.

6. August 2001 (Looking South): Straw bales are used to reduce erosion on the site as part of the Stormwater Pollution Prevention Plan.

7. August 2001 (Looking North): Dump trucks transport imported clay to the Off-Site Area.



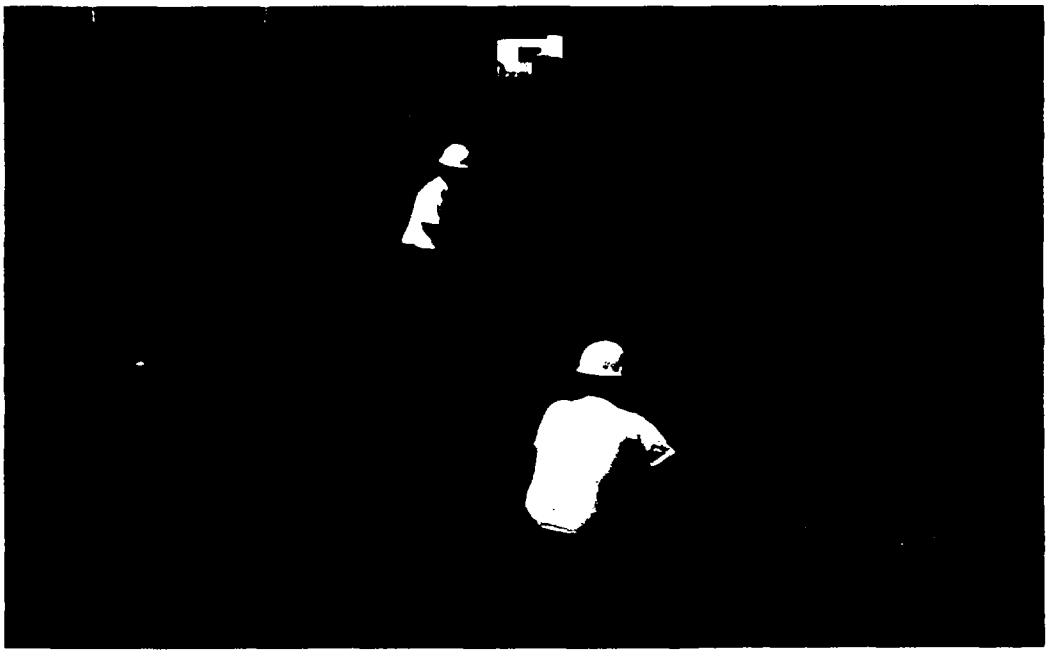
8. August 2001 (Looking West): A water truck spreads treated discharge water from the Groundwater Treatment Plant onto the imported clay to aid in compaction.

9. July 2001 (Looking South): A tractor pulls a sheepsfoot roller (left) to compact the imported clay.

10. July 2001 (Looking West): A bulldozer (right) spreads imported clay across the Off-Site Area in six inch thick lifts.

11. August 2001: The compacted clay is tested using a nuclear density unit to ensure that it meets or exceeds compaction and moisture specifications.

12. August 2001 (Looking West): Drainage swale 1 is shaped by an excavator.

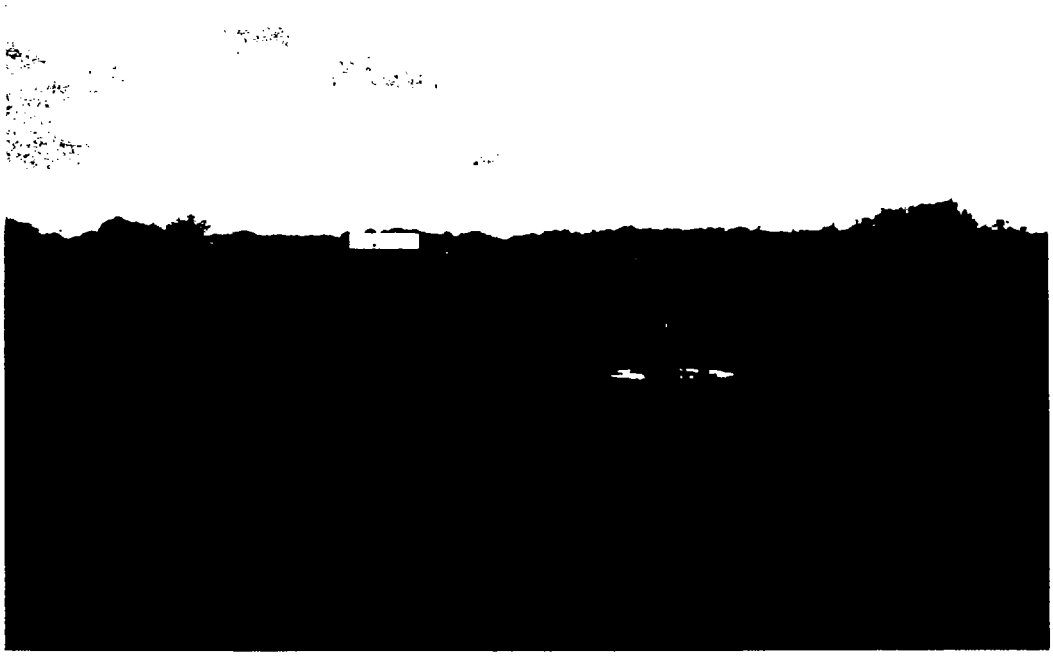


13. August 2001 (Looking Southwest): Geotextile fabric is spread across swale 1 prior to the placement of rip rap.

14. August 2001 (Looking North): Rip rap material is placed in swale 3 along Colfax Ave.

15. August 2001 (Looking North): Removing Off-Site Area piezometers during installation of the temporary engineered cover. The holes are filled with bentonite chips.

16. August 2001 (Looking West): Surveying the in-place clay.



17. November 2001 (Looking South): The Off-Site Area after growth of the grass seed which was planted in the clay cover areas.

APPENDIX C

Air Monitoring Logs for Spoils Piles Consolidation Activities (MEI)

ATMOSPHERIC MONITORING LOG

Description of Site: Hot, humid, sloppy ground.	**Description of Site:** Same.
AM: 85° F.	**PM:** 90° F.
Wind Direction: S Speed: ≅ 5 mph	**Wind Direction:** SE Speed: ≅ 5 mph
Engineering Controls: *Respiratory protection used during* shearing tasks, work area staged upwind of suspect material.	***Level of Protection:*** ***Level D (standard), Level C (shear operator)*** and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

Sample No.	(BG)	Benzene	VC	Remarks
Test				
01	ND	ND	--	Shearing activity of debris in Upper Aquifer gully area. (11:00 am)
02	ND	ND	--	Detention Basin excavation. (11:15 am)
03	ND	--	--	Shearing activity of debris in Upper Aquifer gully area. (12:00 pm)
04	ND	--	--	Detention Basin excavation. (12:15 am)
05	ND	--	--	Shearing activity of debris in Upper Aquifer gully area. (1:00 pm)
06	ND	--	--	Detention Basin excavation. (1:15 am)
07	ND	--	--	Shearing activity of debris in Upper Aquifer gully area. (2:00 pm)
08	ND	--	--	Detention Basin excavation. (2:15 am)
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Many of the IDW drums contained liquid material, apparently water. One emitted a solvent-like odor, per the operator. Shear operator required by HSO to wear respirator. Some drums are under pressure. Operator directed to not cease the shearing operation when personnel were present in the near vicinity. HNue readings were non-detect, however.

Signature: _____ **Date:** 5-17-01 (Thursday)

MEI Representative

ATMOSPHERIC MONITORING LOG

Description of Site: Cool, overcast.	**Description of Site:** Cool, sunny.
AM: 60° F.	**PM:** 65° F.
Wind Direction: NW Speed: ≅ 10 mph	**Wind Direction:** N Speed: ≅ 10 mph
Engineering Controls: Respiratory protection used during shearing tasks, work area staged upwind of suspect material.	**Level of Protection:** **Level D (standard), Level C (shear operator)** and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Test				
01	ND	--	--	Drum shearing activity in Upper Aquifer gully area. (6:30 am)
02	ND	--	--	Detention Basin excavation. (6:35 am)
03	3.0 *	--	--	Drum shearing activity in Upper Aquifer gully area. (7:30 am)
04	ND	--	--	Detention Basin excavation. (7:40 am)
05	ND	--	--	Drum shearing activity in Upper Aquifer gully area. (8:45 am)
06	ND	--	--	Detention Basin excavation. (8:55 am)
07	ND	--	--	Drum shearing activity in Upper Aquifer gully area. (10:00 am)
08	ND	--	--	Detention Basin excavation. (10:15 am)
09	ND	--	--	Drum shearing activity in Upper Aquifer gully area. (11:15 am)
10	ND	--	--	Detention Basin excavation. (11:30 am)
11	ND	--	--	Drum shearing activity in Upper Aquifer gully area. (12:30 pm)
12	ND	--	--	Detention Basin excavation. (12:50 pm)
13	ND	--	--	Drum shearing activity in Upper Aquifer gully area. (1:30 pm)
14	ND	--	--	Detention Basin excavation. (1:35 pm)
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

* The 3 ppm reading may be from shear's exhaust, since sample was taken downwind from the shear-process area. Both shear and forklift operators donned Level C (cartridge respirator) for entire day.

Signature: [signature]
MEI Representative

Date: 5-18-01 (Friday)

ATMOSPHERIC MONITORING LOG

Description of Site: Cool, overcast, light rain.	**Description of Site**:
AM: 55° F.	**PM**: 73° F.
Wind Direction: NE Speed: ≅ 5-10 mph	**Wind Direction**: N Speed: ≅ 5 mph
Engineering Controls: Respiratory protection used during shearing tasks, work area staged upwind of suspect material.	**Level of Protection**: **Level D (standard), Level C (shear operator)** and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

Sampling Event No.	VOC ppm	C6H6 ppm	VC ppm	[illegible] Sampling Location [illegible]
Test				
01	ND	--	--	Drum shearing activity in Upper Aquifer gully area. (6:30 am)
02	ND	--	--	Detention Basin excavation. (7:00 am)
03	ND	--	--	Drum shearing activity at K-P Debris Pile area. (8:00 am)
04	ND	--	--	Detention Basin excavation. (8:15 am)
05	ND	--	--	Drum shearing activity at K-P Debris Pile area. (9:00 am)
06	ND	--	--	Detention Basin excavation. (9:25 am)
07	ND	--	--	Drum shearing activity at K-P Debris Pile area. (10:00 am)
08	ND	--	--	Detention Basin excavation. (10:15 am)
09	ND	--	--	Drum shearing activity at K-P Debris Pile area. (11:00 am)
10	ND	--	--	Detention Basin excavation. (11:15 am)
11	ND	--	--	Drum shearing activity at K-P Debris Pile area. (12:00 pm)
12	ND	--	--	Detention Basin excavation. (12:15 pm)
13	ND	--	--	Drum shearing activity at K-P Debris Pile area. (1:15 pm)
14	ND	--	--	Detention Basin excavation. (1:20 pm)
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Completed all drum shearing and emptying by 7:30 am. Moved shear to south side of site to shear metal debris, truck and automobile frames, at K-P Pile area.

Signature: [signature]
MEI Representative

Date: 5-21-01 (Monday)

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[redacted]

ATMOSPHERIC MONITORING LOG

Description of Site: Cool.	**Description of Site**: *Windy, some rain.*
AM: 45° F.	**PM**: 60° F.
Wind Direction: N Speed: ≅ 10 mph	**Wind Direction**: W Speed: ≅ 15 mph
Engineering Controls: Respiratory protection used during shearing tasks, work area staged upwind of suspect material.	**Level of Protection**: **Level D** (standard), Level C and Level B when required. (items in **Bold Type** represent actual *Levels of Protection implemented this day*).

Sample Number	VOC (ppm)	Gastec (ppm)	Gastec (ppm)	Comments
Test				
01	ND	ND	ND	Drum shearing activity at K-P Debris Pile area. (6:30 am)
02	ND	--	--	Detention Basin excavation. (7:30 am)
03	ND	ND	ND	Drum shearing activity at K-P Debris Pile area. (9:00 am)
04	ND	--	--	Drum shearing activity at K-P Debris Pile area. (11:15 am)
05	ND	--	--	Drum shearing activity at K-P Debris Pile area. (12:50 pm)
06				
07				
08				
09				
10				
11				
12				
13				
14				
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Began shearing at south side of K-P Pile. Conducted VOC monitoring initially and when tanks were being sheared.
Completed K-P Pile today. Shear to be decontaminated and demobed.

Signature: _____ **Date**: 5-22-01 (Tuesday)
MEI Representative

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ATMOSPHERIC MONITORING LOG

Description of Site: Cool, overcast.	**Description of Site:** Overcast.
AM: 55° F.	**PM:** 60° F.
Wind Direction: Speed: ≅ 0-3 mph	**Wind Direction:** Speed: ≅ 0-3 mph
Engineering Controls: Air monitoring.	**Level of Protection:** **Level D (standard), Level C and Level B when required. (items in Bold Type represent actual** *Levels of Protection implemented this day).*

[illegible]	VOC	[illegible]	[illegible]	[illegible]
Test				
01	ND	ND	ND	Detention Basin area. (6:30 am)
02	ND	ND	ND	Detention Basin area. (7:00 am)
03	ND	--	--	Detention Basin area. (8:00 am)
04	ND	--	--	Detention Basin area. (9:00 am)
05	ND	--	--	Detention Basin area. (10:00 am)
06	ND	--	--	Detention Basin area. (11:00 am)
07	ND	--	--	Detention Basin area. (12:00 pm)
08	ND	--	--	Detention Basin area. (1:00 pm)
09				
10				
11				
12				
13				
14				
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Decon shear at Treatment Building, remove shear from the site.
Resume Basin Area work. Install concrete debris as rip-rap in Basin, using excavator and track-loader.

Signature: _____ **Date:** 5-23-01 (Wednesday)
MEI Representative

file:/ACS/aml.doc

ATMOSPHERIC MONITORING LOG

Description of Site: Cool, overcast, then sunny.	**Description of Site**: Sunny, hot, then overcast.
AM: 52° F.	**PM**: 85° F.
Wind Direction: S Speed: ≈ 5 mph	**Wind Direction**: S Speed: ≈ 5 mph
Engineering Controls: Air monitoring, work upwind of suspect areas.	**Level of Protection**: **Level D (standard)**, Level C and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

Sampling Point	VOCs (ppm)	CO (ppm)	LEL (%)	Comments
Test				
01	ND	--	--	Extraction well #11 Perimeter. (8:30 am)
02	ND	--	--	Extraction well #11 Perimeter. (9:00 am)
03	ND	--	--	Extraction well #12 Perimeter. (9:30 am)
04	ND	--	--	Extraction well #12 Perimeter. (10:00 am)
05	ND	--	--	Extraction well #13 Perimeter. (10:50 am)
06	ND	--	--	Extraction well #13 Perimeter. (11:15 am)
07	3-4	--	--	(Unsustained) Extraction well #13 Interior/Perimeter. (11:20 am)
08	ND	--	--	Extraction well #14 Perimeter. (11:40 am)
09				Extraction well #14 Interior/Perimeter. (11:50 am)
10	ND	--	--	Extraction well #15 Perimeter. (1:00 pm)
11	ND	--	--	Extraction well #15 Interior/Perimeter. (1:15 pm)
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Interior of well #13 had some VOC readings once lid was removed. WE allowed some time to aerate void prior to continuing work. VOCs downwind measured 5ppm at peak, but quickly dropped to ND levels.

Signature: _____ **Date**: 5-24-01 (Thursday)
MEI Representative

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ATMOSPHERIC MONITORING LOG

Description of Site:	**Description of Site:**
AM: °F.	**PM:** °F.
Wind Direction: Speed: ≅ mph	**Wind Direction:** Speed: ≅ mph
Engineering Controls: Air monitoring, work upwind of suspect areas.	**Level of Protection:** Level D (standard), Level C and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

[illegible]	VOC [illegible]	[illegible]	[illegible]	[illegible]
Test				
01	ND	--	--	Detention Basin. (8:30 am)
02	ND	--	--	Detention Basin. (9:00 am)
03	ND	--	--	Detention Basin. (9:30 am)
04	ND	--	--	Detention Basin. (10:00 am)
05	ND	--	--	Detention Basin. (11:00 am)
06	ND	--	--	Detention Basin. (11:30 am)
07	3-4	--	--	Detention Basin. (12:00 pm)
08	ND	--	--	Detention Basin. (12:30 pm)
09	ND	--	--	Detention Basin. (1:00 pm)
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Delivery and placement of rip-rap in Detention Basin.

Signature: _____ **Date:** 5-25-01 (Friday)

MEI Representative

ATMOSPHERIC MONITORING LOG

Description of Site: Sunny.	**Description of Site:** Sunny.
AM: 55° F.	**PM:** 68° F.
Wind Direction: NE Speed: ≅ 3-5 mph	**Wind Direction:** NE Speed: ≅ 3-5 mph
Engineering Controls: Air monitoring, work upwind of suspect areas, respirator.	**Level of Protection:** **Level D** (standard), **Level C** and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

Sampling Event/Site	VOCs ppm	CARBON ppm	VC ppm	Comments
Test				
01	ND	--	--	PCB Storage Pile. (8:00 am)
02	ND	--	--	PCB Storage Pile. (9:00 am)
03	20	ND	ND	VOC Pile - Begin leveling pile. (11:30 am)
04	45	ND	ND	VOC Pile - leveling pile. (12:00 pm)
05	45	0.05	ND	VOC Pile - leveling pile. (12:10 pm)
06	ND	--	--	KP-Pile / Debris. (1:30pm)
07				
				End personnel air monitoring.
08				
09				
10				
11				

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Operator in Level C during VOC Pile work.

Signature: _____ **Date:** 5-29-01 (Tuesday)

MEI Representative

ATMOSPHERIC MONITORING LOG

Description of Site: Sunny.	**Description of Site:** Sunny.
AM: 55° F.	**PM:** 60° F.
Wind Direction: S Speed: ≅ 3 mph	**Wind Direction:** S Speed: ≅ 5 mph
Engineering Controls: Air monitoring, work upwind of suspect areas, respirator.	**Level of Protection:** Level D (standard), **Level C** and Level B when required. (*items in* **Bold Type** *represent actual* Levels of Protection implemented this day).

Sampling Event No.	VOC ppm	LEL %	H2S ppm	Sampling Location / Work Zone
Test				
01	1-3	ND	ND	Downwind as VOC Pile leveled. (8:00 am)
02	0-1	ND	ND	Downwind as VOC Pile leveled. (9:00 am)
03	ND	--	--	Detention Basin - Level concrete piles. (10:00 am)
04	ND	--	--	Cut swale to drain ponded water at north end of site. (11:00 pm)
05	ND	--	--	Cut swale to drain ponded water at north end of site. (12:00 pm)
06	ND	--	--	West side of site. (1:00pm)
07	ND	--	--	SW Corner of site. (2:00pm)
08				End personnel air monitoring.
09				
10				
11				

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Operator in Level C during VOC Pile grading.
Obtained authorization from MWCI site manager prior to draining ponded site water into Detention Basin.

Signature: _____ **Date:** 5-30-01 (Wednesday)
MEI Representative

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ATMOSPHERIC MONITORING LOG

Description of Site:	***Description of Site:***
AM: ° F.	**PM:** ° F.
Wind Direction: Speed: ≅ mph	**Wind Direction:** Speed: ≅ mph
Engineering Controls: Air monitoring, work upwind of suspect areas.	**Level of Protection: Level D (standard), Level C and Level B when required. (items in Bold Type represent actual Levels of Protection implemented this day).**

Sample No.	VOC ppm	Gastec ppm	VC ppm	Sample Location / Description / Comments
Test				
01	ND	--	--	Site grading. (8:00 am)
02	ND	--	--	Site grading. (9:00 am)
03	ND	--	--	Site grading. (10:00 am)
04	ND	--	--	Site grading. (11:00 pm)
05	ND	--	--	Site grading. (12:00 pm)
06	ND	--	--	Site grading. (1:00pm)
07	ND	--	--	Site grading. (2:00pm)
08				End personnel air monitoring.
09				
10				
11				

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

General site grading.
Assisted MWCI engineer with testing of existing clay cap thicknesses using 6" power-auger.

Signature: Stu Field
MEI Representative

Date: 5-31-01 (Thursday)

ATMOSPHERIC MONITORING LOG

Description of Site:	**Description of Site:**
AM: ° F.	**PM:** ° F.
Wind Direction: Speed: ≅ mph	**Wind Direction:** Speed: ≅ mph
Engineering Controls: Air monitoring, work upwind of suspect areas.	**Level of Protection:** Level D (standard), Level C and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

Sampling Point No.	VOC ppm	C6H6 ppm	VC ppm	Sampling Location / Work Zone
Test				
01	ND	--	--	Site grading/clay placement. (8:00 am)
02	ND	--	--	Site grading/clay placement. (9:00 am)
03	ND	--	--	Site grading/clay placement. (10:00 am)
04	ND	--	--	Site grading/clay placement. (11:00 pm)
05	ND	--	--	Site grading/clay placement. (12:00 pm)
06	ND	--	--	Site grading/clay placement. (1:00pm)
07	ND	--	--	Site grading/clay placement. (2:00pm)
08				End personnel air monitoring.
09				
10				
11				

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

General site grading.
Push stockpiled clay over "leveled" VOC and PCB stockpile areas.

Signature: _____ **Date:** 6-1-01 (Friday)
MEI Representative

ATMOSPHERIC MONITORING LOG

Description of Site:	**Description of Site:**
AM: °F.	**PM:** °F.
Wind Direction: Speed: ≅ mph	**Wind Direction:** Speed: ≅ mph
Engineering Controls: Air monitoring, work upwind of suspect areas.	**Level of Protection: Level D (standard), Level C and Level B when required. (items in Bold Type represent actual Levels of Protection implemented this day).**

Sampling Location	Time	Organic Vapors	Dust	Remarks
Test				
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (–) symbol will appear in the box.

No air monitoring was performed today. No entry work performed in suspect areas. General site grading. Worked one-half-day due to wet ground conditions.

Signature: _____ **Date:** 6-7-01 (Thursday)

MEI Representative

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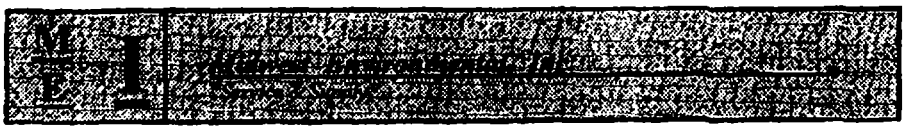

ATMOSPHERIC MONITORING LOG

Description of Site: Sunny.	**Description of Site**: Sunny.
AM: ° F.	**PM**: 74° F.
Wind Direction: Still, calm. Speed: ≅ mph	**Wind Direction**: S Speed: ≅ 5 mph
Engineering Controls: Air monitoring, work upwind of suspect areas, respirator.	**Level of Protection**: **Level D** (standard), Level C and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

Sampling Event No.	VOCs ppm	C6H6 ppm	VC ppm	Sampling Location / Work Zone
Test				
01	ND	--	--	Place clay over "leveled" PCB Pile. (8:00 am)
02	ND	--	--	Place clay over "leveled" PCB Pile. (9:00 am)
03	ND	--	--	Place clay over "leveled" PCB Pile. (10:00 am)
04	0-1	ND	ND	Place clay over "leveled" VOC Pile. (11:00 pm)
05	ND	--	--	Place clay over "leveled" VOC Pile. (12:00 pm)
06	ND	--	--	Place clay over "leveled" VOC Pile. (1:00pm)
07	ND	--	--	Place clay over "leveled" VOC Pile. (2:00pm)
08				*End personnel air monitoring*
09				
10				
11				

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Clay placement - over "leveled" PCB (38 loads) and VOC (65 loads) Piles.

Signature: _____ **Date**: 6-8-01 (Friday)

MEI Representative

ATMOSPHERIC MONITORING LOG

Description of Site: Sunny.	**Description of Site**: Sunny.
AM: 70° F.	**PM**: 88° F.
Wind Direction: NNE Speed: ≅ 3-5 mph	**Wind Direction**: NE Speed: ≅ 3 mph
Engineering Controls: Air monitoring, work upwind of suspect areas, A/C in dozer cab.	**Level of Protection**: **Level D** (standard), Level C and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

Sample/ Record No.:	VOC ppm	C6H6 ppm	VC ppm	Sampling Location / Work Zone
Test				
01	ND	--	--	Place clay over "leveled" VOC Pile. (8:00 am)
02	ND	--	--	Place clay over "leveled" VOC Pile. (9:00 am)
03	ND	--	--	Place clay over Upper-aquifer Pile. (10:00 am)
04	ND	--	--	Place clay over Upper-aquifer Pile. (11:00 pm)
05	ND	--	--	Place clay over Upper-aquifer Pile. (12:00 pm)
06	ND	--	--	Place clay over Upper-aquifer Pile. (1:00pm)
07	ND	--	--	Place clay over Upper-aquifer Pile. (2:00pm)
08				End personnel air monitoring.
09				
10				
11				

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Clay placement - over "leveled" VOC (6-7 loads) and Upper-aquifer (109 loads) Piles.

Signature: _____ **Date**: 6-11-01 (Monday)

MEI Representative

ATMOSPHERIC MONITORING LOG

Description of Site: Overcast, heavy rain event.	**Description of Site:** Sunny, humid.
AM: 72° F.	**PM:** 82° F.
Wind Direction: Speed: ≅ mph	**Wind Direction:** Speed: ≅ mph
Engineering Controls: Air monitoring, work upwind of suspect areas. Modified Level D (less repirator) for decon tasks.	**Level of Protection:** **Level D** (modified), Level C and Level B when required. (items in **Bold Type** represent actual Levels of Protection implemented this day).

Sampling Event No.	VOC ppm	C6H6 ppm	VC ppm	Sampling Location / Work Zone
Test				
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
				End personnel air monitoring.

(BG = background) (ND = none detected)

Additional Notes: Sensidyne Gastec sampling pump apparatus (for Benzene (C6H6) and Vinyl Chloride (VC)) will be implemented when sustained reading of 1 ppm on PID is achieved, and/or more frequently at Safety Officer's discretion. Where no Gastec sampling was performed, a (--) symbol will appear in the box.

Pushed out stockpiled loads of clay over Upper-aquifer area. Rain from last night plus approx. 1/2" this morning resulted in extremely sloppy ground conditions. Deconned D-8 dozer at decon pad (MWCI treatment building).

Signature: _____ **Date:** 6-12-01 (Tuesday)

MEI Representative

APPENDIX D

Chemical Analytical Testing and Risk Assessment of Borrow Source Material (Simalabs/CSA)

Clay Borrow Source Samples – March 14, 2001

MEMORANDUM

MONTGOMERY WATSON

27755 Diehl Road, Suite 300
Warrenville, IL 60555
Tel: (630) 836-8955
Fax: (630) 836-8959

To: ACS File: Job # 2090601 **Date:** April 25, 2001

From: Alex Ellwood

Subject: Borrow source Sampling: 3/14/01
Analytical results and discussion

Based on the analytical results of the composite samples taken from the borrow source, there are no apparent restrictions on using this material as material for the temporary off-site cover.

Composite samples of the top six inches of soil were taken from three areas on the borrow source. Each composite sample represents several soil sample locations in each sample area. Composite sample #SPCSW was obtained from the West Side of the borrow source along the base of the pile. Sample #SPCSC was obtained from the top center of the borrow source. Sample #SPCSE was taken from the East Side of the borrow source.

Each sample was relinquished to a Simalabs International representative and analyzed for the following:

- Pesticides/PCBs
- SVOCs
- Total Antimony
- Total Arsenic
- Total Cyanide
- Total Lead
- Total Mercury
- Total Metals
- Total Selenium
- Total Thallium
- VOCs

A copy of the analytical results for the three composite samples is provided with this memo as Attachment A. No Pesticides, PCBs, SVOCs, or VOCs were present in any of the three composite samples above laboratory detection levels. Metals and other inorganics which were detected in the samples were compared to both U.S. Environmental Protection Agency (USEPA) Region 9 Preliminary Remediation Goals (PRGs) (Attachment B) and

the Indiana Department of Environmental Management (IDEM) Risk Integrated System of Closure (RISC) default closure levels (Attachment C) for industrial soil. Concentrations of analytes detected in all three of the Borrow Source composite samples were below their respective levels provided in the USEPA region 9 and IDEM guidance.

APE/
J:\209\0601\Borrow Source Analytical Discussion

ATTACHMENT A

ANALYTICAL RESULTS FOR BORROW SOURCE COMPOSITE SAMPLES TAKEN ON 3/14/01

SIMALABS
INTERNATIONAL

RECEIVED
APR 1 3 2001
BY:

March 27, 2001

Robert Adams
Montgomery Watson
27755 Diehl Road
Suite 300
Warrenville, IL 60555

RE: ACS, Griffith In. **Work Order: ME0103172**

Dear Robert Adams,

Enclosed are the results for the 3 Samples we received on Wednesday, March 14, 2001 for the analyses presented in the following report.

All data included has been reviewed for and meets all project specific and Quality Control requirements, unless otherwise noted.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

Sincerely,
SIMALABS International

Allyl McCarron
Project Manager

Enclosures

SIMALABS
INTERNATIONAL

SIMALABS International

Date: *Tuesday, March 27, 2001*

CLIENT: Montgomery Watson
Project: ACS, Griffith In.
Lab Order: ME0103172
Date Received: 3/14/01

Work Order/ Sample Delivery Group Summary

Lab Sample ID	Client Sample ID	Client Description	Collection Date
ME0103172-01A	SPCSE	Soil Composite East	14-Mar-01
ME0103172-01B	SPCSE	Soil Composite East	14-Mar-01
ME0103172-02A	SPCSC	Soil Composite Center	14-Mar-01
ME0103172-02B	SPCSC	Soil Composite Center	14-Mar-01
ME0103172-03A	SPCSW	Soil Composite West	14-Mar-01
ME0103172-03B	SPCSW	Soil Composite West	14-Mar-01

250 West 84th Drive, Merrillville, IN 46410 TEL 800 536 8379 TEL 219 769 8378 FAX 219 769 1664

SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSE	*SIMALABS ID:*	ME0103172-01A
Sample Description:	Soil Composite East		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
PESTICIDES/PCBS		*Method: SW8081A*		*Prep Date: 3/23/01*			*Analyst: JLN*
4,4'-DDD	A	*ND*	33		µg/Kg	1	03/24/01
4,4'-DDE	A	*ND*	33		µg/Kg	1	03/24/01
4,4'-DDT	A	*ND*	33		µg/Kg	1	03/24/01
Aldrin	A	*ND*	33		µg/Kg	1	03/24/01
Alpha-BHC	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1016	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1221	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1232	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1242	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1248	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1254	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1260	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1262	A	*ND*	33		µg/Kg	1	03/24/01
Aroclor 1268	A	*ND*	33		µg/Kg	1	03/24/01
Beta-BHC	A	*ND*	33		µg/Kg	1	03/24/01
Chlordane	A	*ND*	330		µg/Kg	1	03/24/01
delta-BHC	A	*ND*	33		µg/Kg	1	03/24/01
Dieldrin	A	*ND*	33		µg/Kg	1	03/24/01
Endosulfan I	A	*ND*	33		µg/Kg	1	03/24/01
Endosulfan II	A	*ND*	33		µg/Kg	1	03/24/01
Endosulfan Sulfate	A	*ND*	33		µg/Kg	1	03/24/01
Endrin	A	*ND*	33		µg/Kg	1	03/24/01
Endrin Aldehyde	A	*ND*	33		µg/Kg	1	03/24/01
Endrin Ketone	A	*ND*	33		µg/Kg	1	03/24/01
Gamma-BHC	A	*ND*	33		µg/Kg	1	03/24/01
Heptachlor	A	*ND*	33		µg/Kg	1	03/24/01
Heptachlor Epoxide	A	*ND*	33		µg/Kg	1	03/24/01
Methoxychlor	A	*ND*	33		µg/Kg	1	03/24/01
Toxaphene	A	*ND*	330		µg/Kg	1	03/24/01
Surr: Decachlorobiphenyl	S	75	50-150		% REC	1	03/24/01
Surr: Tetrachloro-m-xylene	S	75	50-150		% REC	1	03/24/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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B - Detected in the associated Method Blank
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SD - Value diluted out
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E - Value above quantitation range
I -Matrix Interference

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSE	*SIMALABS ID:*	ME0103172-01A
Sample Description:	Soil Composite East		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS		Method: SW8270C		Prep Date: 3/22/01		Analyst: NT	
Acenaphthene	A	ND	330		µg/Kg	1	03/22/01
Acenaphthylene	A	ND	330		µg/Kg	1	03/22/01
Acetophenone	A	ND	330		µg/Kg	1	03/22/01
Aniline	A	ND	330		µg/Kg	1	03/22/01
Anthracene	A	ND	330		µg/Kg	1	03/22/01
Benzidine	A	ND	1600		µg/Kg	1	03/22/01
Benzo[a]anthracene	A	ND	330		µg/Kg	1	03/22/01
Benzo[a]pyrene	A	ND	330		µg/Kg	1	03/22/01
Benzo[b]fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Benzo[g,h,i]perylene	A	ND	330		µg/Kg	1	03/22/01
Benzo[k]fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Benzoic acid	A	ND	1600		µg/Kg	1	03/22/01
Benzyl alcohol	A	ND	660		µg/Kg	1	03/22/01
Bis(2-chloroethoxy)methane	A	ND	330		µg/Kg	1	03/22/01
Bis(2-chloroethyl)ether	A	ND	330		µg/Kg	1	03/22/01
Bis(2-chloroisopropyl)ether	A	ND	330		µg/Kg	1	03/22/01
Bis(2-ethylhexyl)phthalate	A	ND	330		µg/Kg	1	03/22/01
4-Bromophenyl phenyl ether	A	ND	330		µg/Kg	1	03/22/01
Butyl benzyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Carbazole	A	ND	330		µg/Kg	1	03/22/01
4-Chloro-3-methylphenol	A	ND	660		µg/Kg	1	03/22/01
4-Chloroaniline	A	ND	660		µg/Kg	1	03/22/01
2-Chloronaphthalene	A	ND	330		µg/Kg	1	03/22/01
2-Chlorophenol	A	ND	330		µg/Kg	1	03/22/01
4-Chlorophenyl phenyl ether	A	ND	330		µg/Kg	1	03/22/01
Chrysene	A	ND	330		µg/Kg	1	03/22/01
Dibenz[a,h]anthracene	A	ND	330		µg/Kg	1	03/22/01
Dibenzofuran	A	ND	330		µg/Kg	1	03/22/01
1,2-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
1,3-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
1,4-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
3,3'-Dichlorobenzidine	A	ND	1600		µg/Kg	1	03/22/01
2,6-Dichlorophenol	A	ND	330		µg/Kg	1	03/22/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSE	*SIMALABS ID:*	ME0103172-01A
Sample Description:	Soil Composite East		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
2,4-Dichlorophenol	A	ND	330		µg/Kg	1	03/22/01
Diethyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Dimethyl phthalate	A	ND	330		µg/Kg	1	03/22/01
2,4-Dimethylphenol	A	ND	330		µg/Kg	1	03/22/01
Di-n-butyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Di-n-octyl phthalate	A	ND	330		µg/Kg	1	03/22/01
4,6-Dinitro-2-methylphenol	A	ND	1600		µg/Kg	1	03/22/01
2,4-Dinitrophenol	A	ND	1600		µg/Kg	1	03/22/01
2,4-Dinitrotoluene	A	ND	330		µg/Kg	1	03/22/01
2,6-Dinitrotoluene	A	ND	330		µg/Kg	1	03/22/01
1,2-Diphenylhydrazine	A	ND	330		µg/Kg	1	03/22/01
Fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Fluorene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorobenzene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorobutadiene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorocyclopentadiene	A	ND	330		µg/Kg	1	03/22/01
Hexachloroethane	A	ND	330		µg/Kg	1	03/22/01
Indeno[1,2,3cd]pyrene	A	ND	330		µg/Kg	1	03/22/01
Isophorone	A	ND	330		µg/Kg	1	03/22/01
2-Methylnaphthalene	A	ND	330		µg/Kg	1	03/22/01
2-Methylphenol	A	ND	330		µg/Kg	1	03/22/01
3/4-Methylphenol	A	ND	330		µg/Kg	1	03/22/01
2-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
3-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
4-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
2-Nitrophenol	A	ND	330		µg/Kg	1	03/22/01
4-Nitrophenol	A	ND	1600		µg/Kg	1	03/22/01
N-Nitrosodi-n-propylamine	A	ND	330		µg/Kg	1	03/22/01
N-Nitrosodimethylamine	A	ND	330		µg/Kg	1	03/22/01
N-Nitrosodiphenylamine	A	ND	330		µg/Kg	1	03/22/01
Naphthalene	A	ND	330		µg/Kg	1	03/22/01
Nitrobenzene	A	ND	330		µg/Kg	1	03/22/01
Pentachlorophenol	A	ND	1600		µg/Kg	1	03/22/01
Phenanthrene	A	ND	330		µg/Kg	1	03/22/01

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSE	*SIMALABS ID:*	ME0103172-01A
Sample Description:	Soil Composite East		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
Phenol	A	ND	330		µg/Kg	1	03/22/01
Pyrene	A	ND	330		µg/Kg	1	03/22/01
Pyridine	A	ND	330		µg/Kg	1	03/22/01
1,2,4-Trichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
2,4,5-Trichlorophenol	A	ND	1600		µg/Kg	1	03/22/01
2,4,6-Trichlorophenol	A	ND	330		µg/Kg	1	03/22/01
Surr: 2-Fluorobiphenyl	S	56	30-115		% REC	1	03/22/01
Surr: 2-Fluorophenol	S	50	25-121		% REC	1	03/22/01
Surr: Nitrobenzene-d5	S	53	23-120		% REC	1	03/22/01
Surr: Phenol-d5	S	52	24-113		% REC	1	03/22/01
Surr: Terphenyl-d14	S	75	18-137		% REC	1	03/22/01
Surr: 2,4,6-Tribromophenol	S	57	19-122		% REC	1	03/22/01
TOTAL ANTIMONY BY GFAA		Method: SW7041		Prep Date: 3/16/01		Analyst: JTM	
Antimony	A	ND	0.96		mg/Kg	1	03/21/01
TOTAL ARSENIC BY GFAA		Method: SW7060A		Prep Date: 3/16/01		Analyst: JEK	
Arsenic	A	9.4	4.8		mg/Kg	10	03/23/01
TOTAL CYANIDE		Method: 9012A		Prep Date: 3/22/01		Analyst: DG	
Cyanide, Total	A	ND	0.5		mg/Kg	1	03/23/01
TOTAL LEAD BY GFAA		Method: SW7421		Prep Date: 3/16/01		Analyst: JTM	
Lead	A	12	0.96		mg/Kg	4	03/22/01
TOTAL MERCURY		Method: SW7471A		Prep Date: 3/16/01		Analyst: NRP	
Mercury	A	ND	0.048		mg/Kg	1	03/16/01

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSE	*SIMALABS ID:*	ME0103172-01A
Sample Description:	Soil Composite East		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		Method: SW6010B		Prep Date: 3/16/01		Analyst: JEK	
Aluminum	A	*12000*	38		mg/Kg	4	03/23/01
Barium	A	*54*	0.47		mg/Kg	1	03/22/01
Beryllium	A	*1*	0.47		mg/Kg	1	03/22/01
Cadmium	A	*0.98*	0.47		mg/Kg	1	03/22/01
Calcium	A	*25000*	190		mg/Kg	4	03/23/01
Chromium	A	*20*	0.47		mg/Kg	1	03/22/01
Cobalt	A	*8.2*	0.1		mg/Kg	1	03/22/01
Copper	A	*18*	0.47		mg/Kg	1	03/22/01
Iron	A	*16000*	9.4		mg/Kg	4	03/23/01
Magnesium	A	*15000*	9.4		mg/Kg	1	03/22/01
Manganese	A	*370*	0.47		mg/Kg	1	03/22/01
Nickel	A	*20*	0.94		mg/Kg	1	03/22/01
Potassium	A	*3600*	94		mg/Kg	1	03/22/01
Silver	A	*ND*	1.9		mg/Kg	4	03/23/01
Sodium	A	*100*	94		mg/Kg	1	03/22/01
Vanadium	A	*24*	0.94		mg/Kg	1	03/22/01
Zinc	A	*47*	1.4		mg/Kg	1	03/22/01
TOTAL SELENIUM BY GFAA		Method: SW7740A		Prep Date: 3/16/01		Analyst: JTM	
Selenium	A	*0.49*	0.24		mg/Kg	1	03/19/01
TOTAL THALLIUM BY GFAA		Method: SW7841		Prep Date: 3/16/01		Analyst: JEK	
Thallium	A	*ND*	0.24		mg/Kg	1	03/22/01

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ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSE	*SIMALABS ID:*	ME0103172-01B
Sample Description:	Soil Composite East		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS		Method: **SW8260B**	Prep Date:			Analyst: **CLR**	
Acetone	A	ND	50		µg/Kg	1	03/19/01
Acrolein	A	ND	100		µg/Kg	1	03/19/01
Acrylonitrile	A	ND	100		µg/Kg	1	03/19/01
Benzene	A	ND	5		µg/Kg	1	03/19/01
Bromodichloromethane	A	ND	5		µg/Kg	1	03/19/01
Bromoform	A	ND	5		µg/Kg	1	03/19/01
Bromomethane	A	ND	10		µg/Kg	1	03/19/01
2-Butanone	A	ND	10		µg/Kg	1	03/19/01
Carbon Disulfide	A	ND	10		µg/Kg	1	03/19/01
Carbon tetrachloride	A	ND	5		µg/Kg	1	03/19/01
Chlorobenzene	A	ND	5		µg/Kg	1	03/19/01
Chloroethane	A	ND	10		µg/Kg	1	03/19/01
Chloroform	A	ND	5		µg/Kg	1	03/19/01
Chloromethane	A	ND	10		µg/Kg	1	03/19/01
Dibromochloromethane	A	ND	5		µg/Kg	1	03/19/01
1,1-Dichloroethane	A	ND	5		µg/Kg	1	03/19/01
1,2-Dichloroethane	A	ND	5		µg/Kg	1	03/19/01
1,1-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
cis-1,2-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
trans-1,2-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
1,2-Dichloropropane	A	ND	5		µg/Kg	1	03/19/01
cis-1,3-Dichloropropene	A	ND	5		µg/Kg	1	03/19/01
trans-1,3-Dichloropropene	A	ND	5		µg/Kg	1	03/19/01
Ethylbenzene	A	ND	5		µg/Kg	1	03/19/01
2-Hexanone	A	ND	5		µg/Kg	1	03/19/01
4-Methyl-2-Pentanone	A	ND	5		µg/Kg	1	03/19/01
Methyl-t-Butyl Ether	A	ND	10		µg/Kg	1	03/19/01
Methylene chloride	A	ND	10		µg/Kg	1	03/19/01
Styrene	A	ND	5		µg/Kg	1	03/19/01
1,1,1,2-Tetrachloroethane	A	ND	10		µg/Kg	1	03/19/01
1,1,2,2-Tetrachloroethane	A	ND	5		µg/Kg	1	03/19/01
Tetrachloroethene	A	ND	5		µg/Kg	1	03/19/01
Toluene	A	ND	5		µg/Kg	1	03/19/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSE	*SIMALABS ID:*	ME0103172-01B
Sample Description:	Soil Composite East		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
1,1,1-Trichloroethane	A	ND	5		µg/Kg	1	03/19/01
1,1,2-Trichloroethane	A	ND	5		µg/Kg	1	03/19/01
Trichloroethene	A	ND	5		µg/Kg	1	03/19/01
Trichlorofluoromethane	A	ND	10		µg/Kg	1	03/19/01
Vinyl Acetate	A	ND	10		µg/Kg	1	03/19/01
Vinyl chloride	A	ND	10		µg/Kg	1	03/19/01
m,p-Xylene	A	ND	5		µg/Kg	1	03/19/01
o-Xylene	A	ND	5		µg/Kg	1	03/19/01
Surr: 4-Bromofluorobenzene	S	92	74-121		% REC	1	03/19/01
Surr: Dibromofluoromethane	S	103	80-120		% REC	1	03/19/01
Surr: 1,2-Dichloroethane-d4	S	107	80-120		% REC	1	03/19/01
Surr: Toluene-d8	S	101	81-117		% REC	1	03/19/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSC	*SIMALABS ID:*	ME0103172-02A
Sample Description:	Soil Composite Center		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
PESTICIDES/PCBS		Method: SW8081A		Prep Date: 3/23/01		Analyst: JLN	
4,4'-DDD	A	ND	33		µg/Kg	1	03/24/01
4,4'-DDE	A	ND	33		µg/Kg	1	03/24/01
4,4'-DDT	A	ND	33		µg/Kg	1	03/24/01
Aldrin	A	ND	33		µg/Kg	1	03/24/01
Alpha-BHC	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1016	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1221	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1232	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1242	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1248	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1254	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1260	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1262	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1268	A	ND	33		µg/Kg	1	03/24/01
Beta-BHC	A	ND	33		µg/Kg	1	03/24/01
Chlordane	A	ND	330		µg/Kg	1	03/24/01
delta-BHC	A	ND	33		µg/Kg	1	03/24/01
Dieldrin	A	ND	33		µg/Kg	1	03/24/01
Endosulfan I	A	ND	33		µg/Kg	1	03/24/01
Endosulfan II	A	ND	33		µg/Kg	1	03/24/01
Endosulfan Sulfate	A	ND	33		µg/Kg	1	03/24/01
Endrin	A	ND	33		µg/Kg	1	03/24/01
Endrin Aldehyde	A	ND	33		µg/Kg	1	03/24/01
Endrin Ketone	A	ND	33		µg/Kg	1	03/24/01
Gamma-BHC	A	ND	33		µg/Kg	1	03/24/01
Heptachlor	A	ND	33		µg/Kg	1	03/24/01
Heptachlor Epoxide	A	ND	33		µg/Kg	1	03/24/01
Methoxychlor	A	ND	33		µg/Kg	1	03/24/01
Toxaphene	A	ND	330		µg/Kg	1	03/24/01
Surr: Decachlorobiphenyl	S	75	50-150		% REC	1	03/24/01
Surr: Tetrachloro-m-xylene	S	75	50-150		% REC	1	03/24/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
T - Tentatively Identified Compound (TIC)

DF - Dilution Factor

Qual: ND - Not Detected at the Reporting Limit
B - Detected in the associated Method Blank
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S - Spike recovery outside recovery limits
SD - Value diluted out
R - RPD outside accepted recovery limits
E - Value above quantitation range
I -Matrix Interference

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSC	*SIMALABS ID:*	ME0103172-02A
Sample Description:	Soil Composite Center		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS		Method: SW8270C		Prep Date: 3/22/01		Analyst: NT	
Acenaphthene	A	ND	330		µg/Kg	1	03/22/01
Acenaphthylene	A	ND	330		µg/Kg	1	03/22/01
Acetophenone	A	ND	330		µg/Kg	1	03/22/01
Aniline	A	ND	330		µg/Kg	1	03/22/01
Anthracene	A	ND	330		µg/Kg	1	03/22/01
Benzidine	A	ND	1600		µg/Kg	1	03/22/01
Benzo[a]anthracene	A	ND	330		µg/Kg	1	03/22/01
Benzo[a]pyrene	A	ND	330		µg/Kg	1	03/22/01
Benzo[b]fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Benzo[g,h,i]perylene	A	ND	330		µg/Kg	1	03/22/01
Benzo[k]fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Benzoic acid	A	ND	1600		µg/Kg	1	03/22/01
Benzyl alcohol	A	ND	660		µg/Kg	1	03/22/01
Bis(2-chloroethoxy)methane	A	ND	330		µg/Kg	1	03/22/01
Bis(2-chloroethyl)ether	A	ND	330		µg/Kg	1	03/22/01
Bis(2-chloroisopropyl)ether	A	ND	330		µg/Kg	1	03/22/01
Bis(2-ethylhexyl)phthalate	A	ND	330		µg/Kg	1	03/22/01
4-Bromophenyl phenyl ether	A	ND	330		µg/Kg	1	03/22/01
Butyl benzyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Carbazole	A	ND	330		µg/Kg	1	03/22/01
4-Chloro-3-methylphenol	A	ND	660		µg/Kg	1	03/22/01
4-Chloroaniline	A	ND	660		µg/Kg	1	03/22/01
2-Chloronaphthalene	A	ND	330		µg/Kg	1	03/22/01
2-Chlorophenol	A	ND	330		µg/Kg	1	03/22/01
4-Chlorophenyl phenyl ether	A	ND	330		µg/Kg	1	03/22/01
Chrysene	A	ND	330		µg/Kg	1	03/22/01
Dibenz[a,h]anthracene	A	ND	330		µg/Kg	1	03/22/01
Dibenzofuran	A	ND	330		µg/Kg	1	03/22/01
1,2-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
1,3-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
1,4-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
3,3'-Dichlorobenzidine	A	ND	1600		µg/Kg	1	03/22/01
2,6-Dichlorophenol	A	ND	330		µg/Kg	1	03/22/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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SD - Value diluted out
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E - Value above quantitation range

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSC	*SIMALABS ID:*	ME0103172-02A
Sample Description:	Soil Composite Center		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
2,4-Dichlorophenol	A	ND	330		µg/Kg	1	03/22/01
Diethyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Dimethyl phthalate	A	ND	330		µg/Kg	1	03/22/01
2,4-Dimethylphenol	A	ND	330		µg/Kg	1	03/22/01
Di-n-butyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Di-n-octyl phthalate	A	ND	330		µg/Kg	1	03/22/01
4,6-Dinitro-2-methylphenol	A	ND	1600		µg/Kg	1	03/22/01
2,4-Dinitrophenol	A	ND	1600		µg/Kg	1	03/22/01
2,4-Dinitrotoluene	A	ND	330		µg/Kg	1	03/22/01
2,6-Dinitrotoluene	A	ND	330		µg/Kg	1	03/22/01
1,2-Diphenylhydrazine	A	ND	330		µg/Kg	1	03/22/01
Fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Fluorene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorobenzene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorobutadiene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorocyclopentadiene	A	ND	330		µg/Kg	1	03/22/01
Hexachloroethane	A	ND	330		µg/Kg	1	03/22/01
Indeno[1,2,3cd]pyrene	A	ND	330		µg/Kg	1	03/22/01
Isophorone	A	ND	330		µg/Kg	1	03/22/01
2-Methylnaphthalene	A	ND	330		µg/Kg	1	03/22/01
2-Methylphenol	A	ND	330		µg/Kg	1	03/22/01
3/4-Methylphenol	A	ND	330		µg/Kg	1	03/22/01
2-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
3-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
4-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
2-Nitrophenol	A	ND	330		µg/Kg	1	03/22/01
4-Nitrophenol	A	ND	1600		µg/Kg	1	03/22/01
N-Nitrosodi-n-propylamine	A	ND	330		µg/Kg	1	03/22/01
N-Nitrosodimethylamine	A	ND	330		µg/Kg	1	03/22/01
N-Nitrosodiphenylamine	A	ND	330		µg/Kg	1	03/22/01
Naphthalene	A	ND	330		µg/Kg	1	03/22/01
Nitrobenzene	A	ND	330		µg/Kg	1	03/22/01
Pentachlorophenol	A	ND	1600		µg/Kg	1	03/22/01
Phenanthrene	A	ND	330		µg/Kg	1	03/22/01

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSC	*SIMALABS ID:*	ME0103172-02A
Sample Description:	Soil Composite Center		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
Phenol	A	ND	330		µg/Kg	1	03/22/01
Pyrene	A	ND	330		µg/Kg	1	03/22/01
Pyridine	A	ND	330		µg/Kg	1	03/22/01
1,2,4-Trichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
2,4,5-Trichlorophenol	A	ND	1600		µg/Kg	1	03/22/01
2,4,6-Trichlorophenol	A	ND	330		µg/Kg	1	03/22/01
Surr: 2-Fluorobiphenyl	S	56	30-115		% REC	1	03/22/01
Surr: 2-Fluorophenol	S	50	25-121		% REC	1	03/22/01
Surr: Nitrobenzene-d5	S	54	23-120		% REC	1	03/22/01
Surr: Phenol-d5	S	52	24-113		% REC	1	03/22/01
Surr: Terphenyl-d14	S	73	18-137		% REC	1	03/22/01
Surr: 2,4,6-Tribromophenol	S	57	19-122		% REC	1	03/22/01
TOTAL ANTIMONY BY GFAA		Method: SW7041		Prep Date: 3/16/01		Analyst: JTM	
Antimony	A	ND	0.93		mg/Kg	1	03/21/01
TOTAL ARSENIC BY GFAA		Method: SW7060A		Prep Date: 3/16/01		Analyst: JEK	
Arsenic	A	8.1	4.7		mg/Kg	10	03/23/01
TOTAL CYANIDE		Method: 9012A		Prep Date: 3/22/01		Analyst: DG	
Cyanide, Total	A	ND	0.5		mg/Kg	1	03/23/01
TOTAL LEAD BY GFAA		Method: SW7421		Prep Date: 3/16/01		Analyst: JTM	
Lead	A	12	0.93		mg/Kg	4	03/21/01
TOTAL MERCURY		Method: SW7471A		Prep Date: 3/16/01		Analyst: NRP	
Mercury	A	ND	0.048		mg/Kg	1	03/16/01

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSC	*SIMALABS ID:*	ME0103172-02A
Sample Description:	Soil Composite Center		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		Method: SW6010B		Prep Date: 3/16/01		Analyst: JEK	
Aluminum	A	*16000*	9.1		mg/Kg	1	03/22/01
Barium	A	*68*	0.45		mg/Kg	1	03/22/01
Beryllium	A	*1.1*	0.45		mg/Kg	1	03/22/01
Cadmium	A	*0.92*	0.45		mg/Kg	1	03/22/01
Calcium	A	*14000*	180		mg/Kg	4	03/23/01
Chromium	A	*19*	0.45		mg/Kg	1	03/22/01
Cobalt	A	*11*	0.1		mg/Kg	1	03/22/01
Copper	A	*20*	0.45		mg/Kg	1	03/22/01
Iron	A	*16000*	9.1		mg/Kg	4	03/23/01
Magnesium	A	*10000*	9.1		mg/Kg	1	03/22/01
Manganese	A	*410*	1.8		mg/Kg	4	03/23/01
Nickel	A	*21*	0.91		mg/Kg	1	03/22/01
Potassium	A	*3100*	91		mg/Kg	1	03/22/01
Silver	A	*ND*	2		mg/Kg	4	03/23/01
Sodium	A	*95*	91		mg/Kg	1	03/22/01
Vanadium	A	*25*	0.91		mg/Kg	1	03/22/01
Zinc	A	*45*	1.4		mg/Kg	1	03/22/01
TOTAL SELENIUM BY GFAA		Method: SW7740A		Prep Date: 3/16/01		Analyst: JTM	
Selenium	A	*ND*	0.23		mg/Kg	1	03/19/01
TOTAL THALLIUM BY GFAA		Method: SW7841		Prep Date: 3/16/01		Analyst: JEK	
Thallium	A	*ND*	0.23		mg/Kg	1	03/22/01

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSC	*SIMALABS ID:*	ME0103172-02B
Sample Description:	Soil Composite Center		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS		Method: **SW8260B**		Prep Date:			Analyst: **CLR**
Acetone	A	ND	50		µg/Kg	1	03/19/01
Acrolein	A	ND	100		µg/Kg	1	03/19/01
Acrylonitrile	A	ND	100		µg/Kg	1	03/19/01
Benzene	A	ND	5		µg/Kg	1	03/19/01
Bromodichloromethane	A	ND	5		µg/Kg	1	03/19/01
Bromoform	A	ND	5		µg/Kg	1	03/19/01
Bromomethane	A	ND	10		µg/Kg	1	03/19/01
2-Butanone	A	ND	10		µg/Kg	1	03/19/01
Carbon Disulfide	A	ND	10		µg/Kg	1	03/19/01
Carbon tetrachloride	A	ND	5		µg/Kg	1	03/19/01
Chlorobenzene	A	ND	5		µg/Kg	1	03/19/01
Chloroethane	A	ND	10		µg/Kg	1	03/19/01
Chloroform	A	ND	5		µg/Kg	1	03/19/01
Chloromethane	A	ND	10		µg/Kg	1	03/19/01
Dibromochloromethane	A	ND	5		µg/Kg	1	03/19/01
1,1-Dichloroethane	A	ND	5		µg/Kg	1	03/19/01
1,2-Dichloroethane	A	ND	5		µg/Kg	1	03/19/01
1,1-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
cis-1,2-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
trans-1,2-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
1,2-Dichloropropane	A	ND	5		µg/Kg	1	03/19/01
cis-1,3-Dichloropropene	A	ND	5		µg/Kg	1	03/19/01
trans-1,3-Dichloropropene	A	ND	5		µg/Kg	1	03/19/01
Ethylbenzene	A	ND	5		µg/Kg	1	03/19/01
2-Hexanone	A	ND	5		µg/Kg	1	03/19/01
4-Methyl-2-Pentanone	A	ND	5		µg/Kg	1	03/19/01
Methyl-t-Butyl Ether	A	ND	10		µg/Kg	1	03/19/01
Methylene chloride	A	ND	10		µg/Kg	1	03/19/01
Styrene	A	ND	5		µg/Kg	1	03/19/01
1,1,1,2-Tetrachloroethane	A	ND	10		µg/Kg	1	03/19/01
1,1,2,2-Tetrachloroethane	A	ND	5		µg/Kg	1	03/19/01
Tetrachloroethene	A	ND	5		µg/Kg	1	03/19/01
Toluene	A	ND	5		µg/Kg	1	03/19/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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SMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSC	*SMALABS ID:*	ME0103172-02B
Sample Description:	Soil Composite Center		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
1,1,1-Trichloroethane	A	ND	5		µg/Kg	1	03/19/01
1,1,2-Trichloroethane	A	ND	5		µg/Kg	1	03/19/01
Trichloroethene	A	ND	5		µg/Kg	1	03/19/01
Trichlorofluoromethane	A	ND	10		µg/Kg	1	03/19/01
Vinyl Acetate	A	ND	10		µg/Kg	1	03/19/01
Vinyl chloride	A	ND	10		µg/Kg	1	03/19/01
m,p-Xylene	A	ND	5		µg/Kg	1	03/19/01
o-Xylene	A	ND	5		µg/Kg	1	03/19/01
Surr: 4-Bromofluorobenzene	S	87	74-121		% REC	1	03/19/01
Surr: Dibromofluoromethane	S	99	80-120		% REC	1	03/19/01
Surr: 1,2-Dichloroethane-d4	S	110	80-120		% REC	1	03/19/01
Surr: Toluene-d8	S	103	81-117		% REC	1	03/19/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSW	*SIMALABS ID:*	ME0103172-03A
Sample Description:	Soil Composite West		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
PESTICIDES/PCBS		Method: SW8081A		Prep Date: 3/23/01		Analyst: JLN	
4,4'-DDD	A	ND	33		µg/Kg	1	03/24/01
4,4'-DDE	A	ND	33		µg/Kg	1	03/24/01
4,4'-DDT	A	ND	33		µg/Kg	1	03/24/01
Aldrin	A	ND	33		µg/Kg	1	03/24/01
Alpha-BHC	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1016	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1221	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1232	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1242	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1248	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1254	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1260	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1262	A	ND	33		µg/Kg	1	03/24/01
Aroclor 1268	A	ND	33		µg/Kg	1	03/24/01
Beta-BHC	A	ND	33		µg/Kg	1	03/24/01
Chlordane	A	ND	330		µg/Kg	1	03/24/01
delta-BHC	A	ND	33		µg/Kg	1	03/24/01
Dieldrin	A	ND	33		µg/Kg	1	03/24/01
Endosulfan I	A	ND	33		µg/Kg	1	03/24/01
Endosulfan II	A	ND	33		µg/Kg	1	03/24/01
Endosulfan Sulfate	A	ND	33		µg/Kg	1	03/24/01
Endrin	A	ND	33		µg/Kg	1	03/24/01
Endrin Aldehyde	A	ND	33		µg/Kg	1	03/24/01
Endrin Ketone	A	ND	33		µg/Kg	1	03/24/01
Gamma-BHC	A	ND	33		µg/Kg	1	03/24/01
Heptachlor	A	ND	33		µg/Kg	1	03/24/01
Heptachlor Epoxide	A	ND	33		µg/Kg	1	03/24/01
Methoxychlor	A	ND	33		µg/Kg	1	03/24/01
Toxaphene	A	ND	330		µg/Kg	1	03/24/01
Surr: Decachlorobiphenyl	S	70	50-150		% REC	1	03/24/01
Surr: Tetrachloro-m-xylene	S	85	50-150		% REC	1	03/24/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
T - Tentatively Identified Compound (TIC)
DF - Dilution Factor

Qual: ND - Not Detected at the Reporting Limit
B - Detected in the associated Method Blank
* - Exceeds Maximum Contaminant Level
S - Spike recovery outside recovery limits
SD - Value diluted out
R - RPD outside accepted recovery limits
E - Value above quantitation range
I - Matrix Interference

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSW	*SIMALABS ID:*	ME0103172-03A
Sample Description:	Soil Composite West		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS		Method: SW8270C		Prep Date: 3/22/01		Analyst: NT	
Acenaphthene	A	ND	330		µg/Kg	1	03/22/01
Acenaphthylene	A	ND	330		µg/Kg	1	03/22/01
Acetophenone	A	ND	330		µg/Kg	1	03/22/01
Aniline	A	ND	330		µg/Kg	1	03/22/01
Anthracene	A	ND	330		µg/Kg	1	03/22/01
Benzidine	A	ND	1600		µg/Kg	1	03/22/01
Benzo[a]anthracene	A	ND	330		µg/Kg	1	03/22/01
Benzo[a]pyrene	A	ND	330		µg/Kg	1	03/22/01
Benzo[b]fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Benzo[g,h,i]perylene	A	ND	330		µg/Kg	1	03/22/01
Benzo[k]fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Benzoic acid	A	ND	1600		µg/Kg	1	03/22/01
Benzyl alcohol	A	ND	660		µg/Kg	1	03/22/01
Bis(2-chloroethoxy)methane	A	ND	330		µg/Kg	1	03/22/01
Bis(2-chloroethyl)ether	A	ND	330		µg/Kg	1	03/22/01
Bis(2-chloroisopropyl)ether	A	ND	330		µg/Kg	1	03/22/01
Bis(2-ethylhexyl)phthalate	A	ND	330		µg/Kg	1	03/22/01
4-Bromophenyl phenyl ether	A	ND	330		µg/Kg	1	03/22/01
Butyl benzyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Carbazole	A	ND	330		µg/Kg	1	03/22/01
4-Chloro-3-methylphenol	A	ND	660		µg/Kg	1	03/22/01
4-Chloroaniline	A	ND	660		µg/Kg	1	03/22/01
2-Chloronaphthalene	A	ND	330		µg/Kg	1	03/22/01
2-Chlorophenol	A	ND	330		µg/Kg	1	03/22/01
4-Chlorophenyl phenyl ether	A	ND	330		µg/Kg	1	03/22/01
Chrysene	A	ND	330		µg/Kg	1	03/22/01
Dibenz[a,h]anthracene	A	ND	330		µg/Kg	1	03/22/01
Dibenzofuran	A	ND	330		µg/Kg	1	03/22/01
1,2-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
1,3-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
1,4-Dichlorobenzene	A	ND	330		µg/Kg	1	03/22/01
3,3'-Dichlorobenzidine	A	ND	1600		µg/Kg	1	03/22/01
2,6-Dichlorophenol	A	ND	330		µg/Kg	1	03/22/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard; T - Tentatively Identified Compound (TIC)

DF - Dilution Factor

Qual: ND - Not Detected at the Reporting Limit; B - Detected in the associated Method Blank; * - Exceeds Maximum Contaminant Level; S - Spike recovery outside recovery limits; SD - Value diluted out; R - RPD outside accepted recovery limits; E - Value above quantitation range; I -Matrix Interference

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSW	*SIMALABS ID:*	ME0103172-03A
Sample Description:	Soil Composite West		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
2,4-Dichlorophenol	A	ND	330		µg/Kg	1	03/22/01
Diethyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Dimethyl phthalate	A	ND	330		µg/Kg	1	03/22/01
2,4-Dimethylphenol	A	ND	330		µg/Kg	1	03/22/01
Di-n-butyl phthalate	A	ND	330		µg/Kg	1	03/22/01
Di-n-octyl phthalate	A	ND	330		µg/Kg	1	03/22/01
4,6-Dinitro-2-methylphenol	A	ND	1600		µg/Kg	1	03/22/01
2,4-Dinitrophenol	A	ND	1600		µg/Kg	1	03/22/01
2,4-Dinitrotoluene	A	ND	330		µg/Kg	1	03/22/01
2,6-Dinitrotoluene	A	ND	330		µg/Kg	1	03/22/01
1,2-Diphenylhydrazine	A	ND	330		µg/Kg	1	03/22/01
Fluoranthene	A	ND	330		µg/Kg	1	03/22/01
Fluorene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorobenzene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorobutadiene	A	ND	330		µg/Kg	1	03/22/01
Hexachlorocyclopentadiene	A	ND	330		µg/Kg	1	03/22/01
Hexachloroethane	A	ND	330		µg/Kg	1	03/22/01
Indeno[1,2,3cd]pyrene	A	ND	330		µg/Kg	1	03/22/01
Isophorone	A	ND	330		µg/Kg	1	03/22/01
2-Methylnaphthalene	A	ND	330		µg/Kg	1	03/22/01
2-Methylphenol	A	ND	330		µg/Kg	1	03/22/01
3/4-Methylphenol	A	ND	330		µg/Kg	1	03/22/01
2-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
3-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
4-Nitroaniline	A	ND	1600		µg/Kg	1	03/22/01
2-Nitrophenol	A	ND	330		µg/Kg	1	03/22/01
4-Nitrophenol	A	ND	1600		µg/Kg	1	03/22/01
N-Nitrosodi-n-propylamine	A	ND	330		µg/Kg	1	03/22/01
N-Nitrosodimethylamine	A	ND	330		µg/Kg	1	03/22/01
N-Nitrosodiphenylamine	A	ND	330		µg/Kg	1	03/22/01
Naphthalene	A	ND	330		µg/Kg	1	03/22/01
Nitrobenzene	A	ND	330		µg/Kg	1	03/22/01
Pentachlorophenol	A	ND	1600		µg/Kg	1	03/22/01
Phenanthrene	A	ND	330		µg/Kg	1	03/22/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSW	*SIMALABS ID:*	ME0103172-03A
Sample Description:	Soil Composite West		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
Phenol	A	*ND*	330		µg/Kg	1	03/22/01
Pyrene	A	*ND*	330		µg/Kg	1	03/22/01
Pyridine	A	*ND*	330		µg/Kg	1	03/22/01
1,2,4-Trichlorobenzene	A	*ND*	330		µg/Kg	1	03/22/01
2,4,5-Trichlorophenol	A	*ND*	1600		µg/Kg	1	03/22/01
2,4,6-Trichlorophenol	A	*ND*	330		µg/Kg	1	03/22/01
Surr: 2-Fluorobiphenyl	S	49	30-115		% REC	1	03/22/01
Surr: 2-Fluorophenol	S	43	25-121		% REC	1	03/22/01
Surr: Nitrobenzene-d5	S	48	23-120		% REC	1	03/22/01
Surr: Phenol-d5	S	46	24-113		% REC	1	03/22/01
Surr: Terphenyl-d14	S	66	18-137		% REC	1	03/22/01
Surr: 2,4,6-Tribromophenol	S	52	19-122		% REC	1	03/22/01
TOTAL ANTIMONY BY GFAA		Method: **SW7041**		Prep Date: **3/16/01**		Analyst: **JTM**	
Antimony	A	*ND*	0.94		mg/Kg	1	03/21/01
TOTAL ARSENIC BY GFAA		Method: **SW7060A**		Prep Date: **3/16/01**		Analyst: **JEK**	
Arsenic	A	*6.5*	4.7		mg/Kg	10	03/23/01
TOTAL CYANIDE		Method: **9012A**		Prep Date: **3/22/01**		Analyst: **DG**	
Cyanide, Total	A	*ND*	0.5		mg/Kg	1	03/23/01
TOTAL LEAD BY GFAA		Method: **SW7421**		Prep Date: **3/16/01**		Analyst: **JTM**	
Lead	A	*10*	0.94		mg/Kg	4	03/21/01
TOTAL MERCURY		Method: **SW7471A**		Prep Date: **3/16/01**		Analyst: **NRP**	
Mercury	A	*ND*	0.045		mg/Kg	1	03/16/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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Qual: ND - Not Detected at the Reporting Limit
B - Detected in the associated Method Blank
* - Exceeds Maximum Contaminant Level

S - Spike recovery outside recovery limits
SD - Value diluted out
R - RPD outside accepted recovery limits
E - Value above quantitation range
I -Matrix Interference

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSW	*SIMALABS ID:*	ME0103172-03A
Sample Description:	Soil Composite West		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		Method: SW6010B		Prep Date: 3/16/01		Analyst: JEK	
Aluminum	A	*7300*	9.5		mg/Kg	1	03/22/01
Barium	A	*33*	0.48		mg/Kg	1	03/22/01
Beryllium	A	*0.52*	0.48		mg/Kg	1	03/22/01
Cadmium	A	*ND*	0.48		mg/Kg	1	03/22/01
Calcium	A	*31000*	190		mg/Kg	4	03/23/01
Chromium	A	*12*	0.48		mg/Kg	1	03/22/01
Cobalt	A	*6.9*	0.1		mg/Kg	1	03/22/01
Copper	A	*13*	0.48		mg/Kg	1	03/22/01
Iron	A	*10000*	9.5		mg/Kg	4	03/23/01
Magnesium	A	*16000*	9.5		mg/Kg	1	03/22/01
Manganese	A	*350*	0.48		mg/Kg	1	03/22/01
Nickel	A	*24*	0.95		mg/Kg	1	03/22/01
Potassium	A	*1300*	95		mg/Kg	1	03/22/01
Silver	A	*ND*	1.9		mg/Kg	4	03/23/01
Sodium	A	*98*	95		mg/Kg	1	03/22/01
Vanadium	A	*14*	0.95		mg/Kg	1	03/22/01
Zinc	A	*35*	1.4		mg/Kg	1	03/22/01
TOTAL SELENIUM BY GFAA		Method: SW7740A		Prep Date: 3/16/01		Analyst: JTM	
Selenium	A	*ND*	0.24		mg/Kg	1	03/19/01
TOTAL THALLIUM BY GFAA		Method: SW7841		Prep Date: 3/16/01		Analyst: JEK	
Thallium	A	*ND*	0.24		mg/Kg	1	03/22/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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B - Detected in the associated Method Blank
* - Exceeds Maximum Contaminant Level
S - Spike recovery outside recovery limits
SD - Value diluted out
R - RPD outside accepted recovery limits
E - Value above quantitation range
I -Matrix Interference

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SIMALABS

INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSW	*SIMALABS ID:*	ME0103172-03B
Sample Description:	Soil Composite West		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS		Method: SW8260B		Prep Date:		Analyst: CLR	
Acetone	A	ND	50		µg/Kg	1	03/19/01
Acrolein	A	ND	100		µg/Kg	1	03/19/01
Acrylonitrile	A	ND	100		µg/Kg	1	03/19/01
Benzene	A	ND	5		µg/Kg	1	03/19/01
Bromodichloromethane	A	ND	5		µg/Kg	1	03/19/01
Bromoform	A	ND	5		µg/Kg	1	03/19/01
Bromomethane	A	ND	10		µg/Kg	1	03/19/01
2-Butanone	A	ND	10		µg/Kg	1	03/19/01
Carbon Disulfide	A	ND	10		µg/Kg	1	03/19/01
Carbon tetrachloride	A	ND	5		µg/Kg	1	03/19/01
Chlorobenzene	A	ND	5		µg/Kg	1	03/19/01
Chloroethane	A	ND	10		µg/Kg	1	03/19/01
Chloroform	A	ND	5		µg/Kg	1	03/19/01
Chloromethane	A	ND	10		µg/Kg	1	03/19/01
Dibromochloromethane	A	ND	5		µg/Kg	1	03/19/01
1,1-Dichloroethane	A	ND	5		µg/Kg	1	03/19/01
1,2-Dichloroethane	A	ND	5		µg/Kg	1	03/19/01
1,1-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
cis-1,2-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
trans-1,2-Dichloroethene	A	ND	5		µg/Kg	1	03/19/01
1,2-Dichloropropane	A	ND	5		µg/Kg	1	03/19/01
cis-1,3-Dichloropropene	A	ND	5		µg/Kg	1	03/19/01
trans-1,3-Dichloropropene	A	ND	5		µg/Kg	1	03/19/01
Ethylbenzene	A	ND	5		µg/Kg	1	03/19/01
2-Hexanone	A	ND	5		µg/Kg	1	03/19/01
4-Methyl-2-Pentanone	A	ND	5		µg/Kg	1	03/19/01
Methyl-t-Butyl Ether	A	ND	10		µg/Kg	1	03/19/01
Methylene chloride	A	ND	10		µg/Kg	1	03/19/01
Styrene	A	ND	5		µg/Kg	1	03/19/01
1,1,1,2-Tetrachloroethane	A	ND	10		µg/Kg	1	03/19/01
1,1,2,2-Tetrachloroethane	A	ND	5		µg/Kg	1	03/19/01
Tetrachloroethene	A	ND	5		µg/Kg	1	03/19/01
Toluene	A	ND	5		µg/Kg	1	03/19/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
T - Tentatively Identified Compound (TIC)

DF - Dilution Factor

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B - Detected in the associated Method Blank
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S - Spike recovery outside recovery limits
SD - Value diluted out
R - RPD outside accepted recovery limits
E - Value above quantitation range
I -Matrix Interference

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INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, March 27, 2001*

Client:	Montgomery Watson	*Client Project:*	ACS, Griffith In.
		Work Order:	ME0103172
Client Sample ID:	SPCSW	*SIMALABS ID:*	ME0103172-03B
Sample Description:	Soil Composite West		
Sample Matrix:	Soil		
Collection Date:	03/14/01		
Date Received:	03/14/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
1,1,1-Trichloroethane	A	*ND*	5		µg/Kg	1	03/19/01
1,1,2-Trichloroethane	A	*ND*	5		µg/Kg	1	03/19/01
Trichloroethene	A	*ND*	5		µg/Kg	1	03/19/01
Trichlorofluoromethane	A	*ND*	10		µg/Kg	1	03/19/01
Vinyl Acetate	A	*ND*	10		µg/Kg	1	03/19/01
Vinyl chloride	A	*ND*	10		µg/Kg	1	03/19/01
m,p-Xylene	A	*ND*	5		µg/Kg	1	03/19/01
o-Xylene	A	*ND*	5		µg/Kg	1	03/19/01
Surr: 4-Bromofluorobenzene	S	77	74-121		% REC	1	03/19/01
Surr: Dibromofluoromethane	S	107	80-120		% REC	1	03/19/01
Surr: 1,2-Dichloroethane-d4	S	112	80-120		% REC	1	03/19/01
Surr: Toluene-d8	S	114	81-117		% REC	1	03/19/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
T - Tentatively Identified Compound (TIC)

DF - Dilution Factor

Qual: ND - Not Detected at the Reporting Limit
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Clay Borrow Source Sample – July 26, 2001
and Topsoil Borrow Source Sample – August 9, 2001

MEMORANDUM

MONTGOMERY WATSON

To: Rob Adams
From: Lesley Hierholzer
Subject: Landfill Cap Clay and Topsoil Sampling: 7/26/01 and 8/9/01
Analytical Results and Discussion

Date: September 5, 2001
Reference: 2090601

Based on the analytical results of the composite samples taken from the borrow source, there are no apparent restrictions based on chemical analytical analysis on using this material as material for the landfill cap.

Two samples were analyzed. The sample of the topsoil, ME0108140-01A, was sent to Simalabs. The second sample, NN05580, was collected from the clayfill and was sent to Central States Analytical (CSA).

Each sample was relinquished to a Simalabs International representative or a Central States Analytical (CSA) representative and analyzed for the following:

- Pesticides/PCBs
- SVOCs
- Total Arsenic
- Total Lead
- Total Mercury
- Total Metals
- Total Selenium
- VOCs

A copy of the analytical results for the three composite samples is provided with this memo as Attachment A. No Pesticides, PCBs, SVOCs, or VOCs were present in the topsoil or clayfill samples above laboratory detection levels. Metals and other inorganics which were detected in the samples were compared to both U.S. Environmental Protection Agency (USEPA) Region 9 Preliminary Remediation Goals (PRGs) (Attachment B) and the Indiana Department of Environmental Management (IDEM) Risk Integrated System of Closure (RISC) default closure levels (Attachment C) for industrial soil. Concentrations of analytes detected in the topsoil or clayfill samples were below their respective levels provided in the USEPA Region 9 and IDEM guidance.

LRH
J:\209\0601ACS\0107 Off-Site Temp Cover\6010107a024

ATTACHMENT A

ANALYTICAL RESULTS FOR TOPSOIL SAMPLE COLLECTED 8/9/01 AND CLAYFILL SAMPLE COLLECTED 7/26/01

SIMALABS
INTERNATIONAL

August 14, 2001

Jeff Wickham
Koester Environmental Services
14649 Highway 41 North
Evansville, IN 47725

RE: Topsoil Sample / ACS Griffith

Work Order No.: ME0108140

Dear Jeff Wickham:

SIMALABS International received 1 sample on 08/09/2001 for the analyses presented in the following report.

All data included has been reviewed for and meets all project specific and Quality Control requirements, unless otherwise noted.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

Sincerely,
SIMALABS International

Allyl McCarron
Project Manager

Enclosures

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SIMALABS

SIMALABS International INTERNATIONAL **Date:** *14-Aug-01*

CLIENT: Koester Environmental Services
Project: Topsoil Sample / ACS Griffith
Lab Order: ME0108140

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
ME0108140-01A	1	Top Soil	08/09/2001 1:30:00 PM	08/09/2001

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INTERNATIONAL

CASE NARRATIVE

Date: *Tuesday, August 14, 2001*

Client: Koester Environmental Services
Project: Topsoil Sample / ACS Griffith
Lab Order: ME0108140

The Matrix Spike (ME0108043-09AMS) and the Matrix Spike Duplicate (ME0108043-09AMSD) met the Selenium acceptance criteria for accuracy. The acceptance criteria for precision were not met (RPD, 23 %)

SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, August 14, 2001*

Client:	Koester Environmental Services	***Client Project:***	Topsoil Sample / ACS Griffith
		Work Order:	ME0108140
Client Sample ID:	1	***SIMALABS ID:***	ME0108140-01A
Sample Description:	Top Soil		
Sample Matrix:	Solid		
Collection Date:	08/09/01		
Date Received:	08/09/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
PESTICIDES/PCBS		Method: **SW8081A**		Prep Date: **08/10/2001**	Analyst: **AS**		
4,4'-DDD	A	*< 33*	33		µg/Kg	1	08/13/01
4,4'-DDE	A	*< 33*	33		µg/Kg	1	08/13/01
4,4'-DDT	A	*< 33*	33		µg/Kg	1	08/13/01
Aldrin	A	*< 33*	33		µg/Kg	1	08/13/01
Alpha-BHC	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1016	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1221	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1232	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1242	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1248	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1254	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1260	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1262	A	*< 33*	33		µg/Kg	1	08/13/01
Aroclor 1268	A	*< 33*	33		µg/Kg	1	08/13/01
Beta-BHC	A	*< 33*	33		µg/Kg	1	08/13/01
Chlordane	A	*< 330*	330		µg/Kg	1	08/13/01
delta-BHC	A	*< 33*	33		µg/Kg	1	08/13/01
Dieldrin	A	*< 33*	33		µg/Kg	1	08/13/01
Endosulfan I	A	*< 33*	33		µg/Kg	1	08/13/01
Endosulfan II	A	*< 33*	33		µg/Kg	1	08/13/01
Endosulfan Sulfate	A	*< 33*	33		µg/Kg	1	08/13/01
Endrin	A	*< 33*	33		µg/Kg	1	08/13/01
Endrin Aldehyde	A	*< 33*	33		µg/Kg	1	08/13/01
Endrin Ketone	A	*< 33*	33		µg/Kg	1	08/13/01
Gamma-BHC	A	*< 33*	33		µg/Kg	1	08/13/01
Heptachlor	A	*< 33*	33		µg/Kg	1	08/13/01
Heptachlor Epoxide	A	*< 33*	33		µg/Kg	1	08/13/01
Methoxychlor	A	*< 33*	33		µg/Kg	1	08/13/01
Toxaphene	A	*< 330*	330		µg/Kg	1	08/13/01
Surr: Decachlorobiphenyl	S	120	50-150		%REC	1	08/13/01
Surr: Tetrachloro-m-xylene	S	90.0	50-150		%REC	1	08/13/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
T - Tentatively Identified Compound (TIC)

DF - Dilution Factor

Qual: ND - Not Detected at the Reporting Limit
B - Detected in the associated Method Blank
* - Exceeds Maximum Contaminant Level
S - Spike recovery outside recovery limits
SD - Value diluted out
R - RPD outside accepted recovery limits
E - Value above quantitation range
I -Matrix Interference

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, August 14, 2001*

Client:	Koester Environmental Services	***Client Project:***	Topsoil Sample / ACS Griffith
		Work Order:	ME0108140
Client Sample ID:	1	***SIMALABS ID:***	ME0108140-01A
Sample Description:	Top Soil		
Sample Matrix:	Solid		
Collection Date:	08/09/01		
Date Received:	08/09/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		Method: **SW6010B**		Prep Date: **08/09/2001**		Analyst: **JJA**	
Barium	A	***77***	0.53		mg/Kg	1	08/10/01
Cadmium	A	***1.4***	0.53		mg/Kg	1	08/10/01
Chromium	A	***15***	0.53		mg/Kg	1	08/10/01
Copper	A	***25***	0.53		mg/Kg	1	08/10/01
Nickel	A	***16***	1.1		mg/Kg	1	08/10/01
Silver	A	***< 0.53***	0.53		mg/Kg	1	08/10/01
Zinc	A	***49***	1.6		mg/Kg	1	08/10/01
TOTAL ARSENIC BY GFAA		Method: **SW7060A**		Prep Date: **08/09/2001**		Analyst: **JEK**	
Arsenic	A	***< 23***	23		mg/Kg	50	08/13/01
TOTAL MERCURY		Method: **SW7471A**		Prep Date: **08/10/2001**		Analyst: **NRP**	
Mercury	A	***< 0.050***	0.050		mg/Kg	1	08/10/01
TOTAL LEAD BY GFAA		Method: **SW7421**		Prep Date: **08/09/2001**		Analyst: **JEK**	
Lead	A	***23***	4.5		mg/Kg	20	08/14/01
TOTAL SELENIUM BY GFAA		Method: **SW7740A**		Prep Date: **08/09/2001**		Analyst: **JTM**	
Selenium	A	***1.2***	0.23		mg/Kg	1	08/10/01
SEMIVOLATILE ORGANICS		Method: **SW8270C**		Prep Date: **08/09/2001**		Analyst: **CLR**	
Acenaphthene	A	***< 330***	330		µg/Kg	1	08/13/01
Acenaphthylene	A	***< 330***	330		µg/Kg	1	08/13/01
Acetophenone	A	***< 330***	330		µg/Kg	1	08/13/01
Aniline	A	***< 330***	330		µg/Kg	1	08/13/01
Anthracene	A	***< 330***	330		µg/Kg	1	08/13/01
Benzidine	A	***< 1600***	1600		µg/Kg	1	08/13/01
Benzo[a]anthracene	A	***< 330***	330		µg/Kg	1	08/13/01
Benzo[a]pyrene	A	***< 330***	330		µg/Kg	1	08/13/01
Benzo[b]fluoranthene	A	***< 330***	330		µg/Kg	1	08/13/01
Benzo[g,h,i]perylene	A	***< 330***	330		µg/Kg	1	08/13/01
Benzo[k]fluoranthene	A	***< 330***	330		µg/Kg	1	08/13/01
Benzoic acid	A	***< 1600***	1600		µg/Kg	1	08/13/01
Benzyl alcohol	A	***< 660***	660		µg/Kg	1	08/13/01
Bis(2-chloroethoxy)methane	A	***< 330***	330		µg/Kg	1	08/13/01
Bis(2-chloroethyl)ether	A	***< 330***	330		µg/Kg	1	08/13/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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DF - *Dilution Factor*

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R - RPD outside accepted recovery limits
E - Value above quantitation range
I - Matrix Interference

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, August 14, 2001*

Client:	Koester Environmental Services	***Client Project:***	Topsoil Sample / ACS Griffith
		Work Order:	ME0108140
Client Sample ID:	1	***SIMALABS ID:***	ME0108140-01A
Sample Description:	Top Soil		
Sample Matrix:	Solid		
Collection Date:	08/09/01		
Date Received:	08/09/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS		Method: **SW8270C**		Prep Date: **08/09/2001**	Analyst: **CLR**		
Bis(2-chloroisopropyl)ether	A	*< 330*	330		µg/Kg	1	08/13/01
Bis(2-ethylhexyl)phthalate	A	*< 330*	330		µg/Kg	1	08/13/01
4-Bromophenyl phenyl ether	A	*< 330*	330		µg/Kg	1	08/13/01
Butyl benzyl phthalate	A	*< 330*	330		µg/Kg	1	08/13/01
Carbazole	A	*< 330*	330		µg/Kg	1	08/13/01
4-Chloro-3-methylphenol	A	*< 660*	660		µg/Kg	1	08/13/01
4-Chloroaniline	A	*< 660*	660		µg/Kg	1	08/13/01
2-Chloronaphthalene	A	*< 330*	330		µg/Kg	1	08/13/01
2-Chlorophenol	A	*< 330*	330		µg/Kg	1	08/13/01
4-Chlorophenyl phenyl ether	A	*< 330*	330		µg/Kg	1	08/13/01
Chrysene	A	*< 330*	330		µg/Kg	1	08/13/01
Dibenz[a,h]anthracene	A	*< 330*	330		µg/Kg	1	08/13/01
Dibenzofuran	A	*< 330*	330		µg/Kg	1	08/13/01
1,2-Dichlorobenzene	A	*< 330*	330		µg/Kg	1	08/13/01
1,3-Dichlorobenzene	A	*< 330*	330		µg/Kg	1	08/13/01
1,4-Dichlorobenzene	A	*< 330*	330		µg/Kg	1	08/13/01
3,3'-Dichlorobenzidine	A	*< 1600*	1600		µg/Kg	1	08/13/01
2,6-Dichlorophenol	A	*< 330*	330		µg/Kg	1	08/13/01
2,4-Dichlorophenol	A	*< 330*	330		µg/Kg	1	08/13/01
Diethyl phthalate	A	*< 330*	330		µg/Kg	1	08/13/01
Dimethyl phthalate	A	*< 330*	330		µg/Kg	1	08/13/01
2,4-Dimethylphenol	A	*< 330*	330		µg/Kg	1	08/13/01
Di-n-butyl phthalate	A	*< 330*	330		µg/Kg	1	08/13/01
Di-n-octyl phthalate	A	*< 330*	330		µg/Kg	1	08/13/01
4,6-Dinitro-2-methylphenol	A	*< 1600*	1600		µg/Kg	1	08/13/01
2,4-Dinitrophenol	A	*< 1600*	1600		µg/Kg	1	08/13/01
2,4-Dinitrotoluene	A	*< 330*	330		µg/Kg	1	08/13/01
2,6-Dinitrotoluene	A	*< 330*	330		µg/Kg	1	08/13/01
1,2-Diphenylhydrazine	A	*< 330*	330		µg/Kg	1	08/13/01
Fluoranthene	A	*< 330*	330		µg/Kg	1	08/13/01
Fluorene	A	*< 330*	330		µg/Kg	1	08/13/01
Hexachlorobenzene	A	*< 330*	330		µg/Kg	1	08/13/01

Samp Type: A - Analyte, S - Surrogate, I - Internal Standard
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E - Value above quantitation range
I -Matrix Interference

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ANALYTICAL RESULTS

Date: *Tuesday, August 14, 2001*

Client:	Koester Environmental Services	***Client Project:***	Topsoil Sample / ACS Griffith
		Work Order:	ME0108140
Client Sample ID:	1	***SIMALABS ID:***	ME0108140-01A
Sample Description:	Top Soil		
Sample Matrix:	Solid		
Collection Date:	08/09/01		
Date Received:	08/09/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS		Method: **SW8270C**		Prep Date: **08/09/2001**	Analyst: **CLR**		
Hexachlorobutadiene	A	*< 330*	330		µg/Kg	1	08/13/01
Hexachlorocyclopentadiene	A	*< 330*	330		µg/Kg	1	08/13/01
Hexachloroethane	A	*< 330*	330		µg/Kg	1	08/13/01
Indeno[1,2,3cd]pyrene	A	*< 330*	330		µg/Kg	1	08/13/01
Isophorone	A	*< 330*	330		µg/Kg	1	08/13/01
2-Methylnaphthalene	A	*< 330*	330		µg/Kg	1	08/13/01
2-Methylphenol	A	*< 330*	330		µg/Kg	1	08/13/01
3/4-Methylphenol	A	*< 330*	330		µg/Kg	1	08/13/01
2-Nitroaniline	A	*< 1600*	1600		µg/Kg	1	08/13/01
3-Nitroaniline	A	*< 1600*	1600		µg/Kg	1	08/13/01
4-Nitroaniline	A	*< 1600*	1600		µg/Kg	1	08/13/01
2-Nitrophenol	A	*< 330*	330		µg/Kg	1	08/13/01
4-Nitrophenol	A	*< 1600*	1600		µg/Kg	1	08/13/01
N-Nitrosodi-n-propylamine	A	*< 330*	330		µg/Kg	1	08/13/01
N-Nitrosodimethylamine	A	*< 330*	330		µg/Kg	1	08/13/01
N-Nitrosodiphenylamine	A	*< 330*	330		µg/Kg	1	08/13/01
Naphthalene	A	*< 330*	330		µg/Kg	1	08/13/01
Nitrobenzene	A	*< 330*	330		µg/Kg	1	08/13/01
Pentachlorophenol	A	*< 1600*	1600		µg/Kg	1	08/13/01
Phenanthrene	A	*< 330*	330		µg/Kg	1	08/13/01
Phenol	A	*< 330*	330		µg/Kg	1	08/13/01
Pyrene	A	*< 330*	330		µg/Kg	1	08/13/01
Pyridine	A	*< 330*	330		µg/Kg	1	08/13/01
1,2,4-Trichlorobenzene	A	*< 330*	330		µg/Kg	1	08/13/01
2,4,5-Trichlorophenol	A	*< 1600*	1600		µg/Kg	1	08/13/01
2,4,6-Trichlorophenol	A	*< 330*	330		µg/Kg	1	08/13/01
Surr: 2-Fluorobiphenyl	S	43.3	30-115		%REC	1	08/13/01
Surr: 2-Fluorophenol	S	34.6	25-121		%REC	1	08/13/01
Surr: Nitrobenzene-d5	S	37.7	23-120		%REC	1	08/13/01
Surr: Phenol-d5	S	38.4	24-113		%REC	1	08/13/01
Surr: Terphenyl-d14	S	53.0	18-137		%REC	1	08/13/01
Surr: 2,4,6-Tribromophenol	S	51.3	19-122		%REC	1	08/13/01

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250 West 84th Drive, Merrillville, IN 46410 TEL 800.836.8529 TEL 219.769.8378 FAX 219.769.1664

SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, August 14, 2001*

Client:	Koester Environmental Services	***Client Project:***	Topsoil Sample / ACS Griffith
		Work Order:	ME0108140
Client Sample ID:	1	***SIMALABS ID:***	ME0108140-01A
Sample Description:	Top Soil		
Sample Matrix:	Solid		
Collection Date:	08/09/01		
Date Received:	08/09/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS		Method: **SW8260B**		Prep Date:		Analyst: **JLN**	
Acetone	A	*< 50*	50		µg/Kg	1	08/14/01
Acrolein	A	*< 100*	100		µg/Kg	1	08/14/01
Acrylonitrile	A	*< 100*	100		µg/Kg	1	08/14/01
Benzene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Bromodichloromethane	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Bromoform	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Bromomethane	A	*< 10*	10		µg/Kg	1	08/14/01
2-Butanone	A	*< 10*	10		µg/Kg	1	08/14/01
Carbon Disulfide	A	*< 10*	10		µg/Kg	1	08/14/01
Carbon tetrachloride	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Chlorobenzene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Chloroethane	A	*< 10*	10		µg/Kg	1	08/14/01
Chloroform	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Chloromethane	A	*< 10*	10		µg/Kg	1	08/14/01
Dibromochloromethane	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
1,1-Dichloroethane	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
1,2-Dichloroethane	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
1,1-Dichloroethene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
cis-1,2-Dichloroethene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
trans-1,2-Dichloroethene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
1,2-Dichloropropane	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
cis-1,3-Dichloropropene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
trans-1,3-Dichloropropene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Ethylbenzene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
2-Hexanone	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
4-Methyl-2-Pentanone	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Methyl-t-Butyl Ether	A	*< 10*	10		µg/Kg	1	08/14/01
Methylene chloride	A	*19*	10		µg/Kg	1	08/14/01
Styrene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
1,1,1,2-Tetrachloroethane	A	*< 10*	10		µg/Kg	1	08/14/01
1,1,2,2-Tetrachloroethane	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Tetrachloroethene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01

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SIMALABS
INTERNATIONAL

ANALYTICAL RESULTS

Date: *Tuesday, August 14, 2001*

Client:	Koester Environmental Services	***Client Project:***	Topsoil Sample / ACS Griffith
		Work Order:	ME0108140
Client Sample ID:	1	***SIMALABS ID:***	ME0108140-01A
Sample Description:	Top Soil		
Sample Matrix:	Solid		
Collection Date:	08/09/01		
Date Received:	08/09/01		

Analyses	Samp Type	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANICS		Method: **SW8260B**	Prep Date:			Analyst: **JLN**	
Toluene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
1,1,1-Trichloroethane	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
1,1,2-Trichloroethane	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Trichloroethene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Trichlorofluoromethane	A	*< 10*	10		µg/Kg	1	08/14/01
Vinyl Acetate	A	*< 10*	10		µg/Kg	1	08/14/01
Vinyl chloride	A	*< 10*	10		µg/Kg	1	08/14/01
m,p-Xylene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
o-Xylene	A	*< 5.0*	5.0		µg/Kg	1	08/14/01
Surr: 4-Bromofluorobenzene	S	78.3	74-121		%REC	1	08/14/01
Surr: Dibromofluoromethane	S	97.8	80-120		%REC	1	08/14/01
Surr: 1,2-Dichloroethane-d4	S	100	80-120		%REC	1	08/14/01
Surr: Toluene-d8	S	115	81-117		%REC	1	08/14/01

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Koester Environmental Services
14694 HWY 41 N.
Evansville, IN 47711-1787

Attn: Jeff Wickham

Your Reference: ACS GRIFFITH, IN
Project Comments:

Date Received: 07/30/01
Date Reported: 08/22/01
Date Sampled: 07/26/01
Sample ID#: NN05580

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Aldrin	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
alpha-BHC	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
beta-BHC	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
delta-BHC	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
gamma-BHC	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Chlordane	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
4,4-DDD	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
4,4-DDE	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
4,4-DDT	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Dieldrin	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Endosulfan I	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Endosulfan II	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Endosulfan sulfate	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Endrin	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Endrin aldehyde	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Endrin ketone	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Heptachlor	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Heptachlor epoxide	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Methoxychlor	< 0.10	mg/Kg	0.10	08/07/01	DEN	SW-846/8081A
Toxaphene	< 0.50	mg/Kg	0.50	08/07/01	DEN	SW-846/8081A
Chloromethane	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
Vinyl Chloride	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
Bromomethane	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
Chloroethane	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
Trichlorofluoromethane	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
Acetone	< 50	ug/Kg	50	08/08/01	JAD	SW846-8260A
1,1-Dichloroethylene	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
Methylene Chloride	< 50	ug/Kg	50	08/08/01	JAD	SW846-8260A
trans-1,2-Dichloroethylene	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
1,1-Dichloroethane	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
2-Butanone (MEK)	< 50	ug/Kg	50	08/08/01	JAD	SW846-8260A
cis-1,2-Dichloroethylene	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A
Chloroform	15	ug/Kg	10	08/08/01	JAD	SW846-8260A
1,1,1-Trichloroethane	< 10	ug/Kg	10	08/08/01	JAD	SW846-8260A

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Sample ID#: NN05580

Your Reference: ACS GRIFFITH, IN
Project Comments:

arameters	Results	Units	MDL	Analysis Date	Analyst	Method
Hexachloroethane	< 600	ug/Kg	600	08/07/01	SAS	SW846-8270B
ıdeno(1,2,3-cd)pyrene	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
.sophorone	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
2-Methylnaphthalene	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
aphthalene	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
-Nitroaniline	< 600	ug/Kg	600	08/07/01	SAS	SW846-8270B
m-Nitroaniline	< 600	ug/Kg	600	08/07/01	SAS	SW846-8270B
-Nitroaniline	< 600	ug/Kg	600	08/07/01	SAS	SW846-8270B
.itrobenzene	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
2-Nitrophenol	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
-Nitrophenol	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
.-Nitrosodimethylamine	< 600	ug/Kg	600	08/07/01	SAS	SW846-8270B
N-Nitrosodiphenylamine	< 600	ug/Kg	600	08/07/01	SAS	SW846-8270B
-Nitrosodi-n-propylamine	< 600	ug/Kg	600	08/07/01	SAS	SW846-8270B
_ entachlorophenol	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
Phenathrene	< 600	ug/Kg	600	08/07/01	SAS	SW846-8270B
henol	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
yrene	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
1,2,4-Trichlorobenzene	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
4,5-Trichlorophenol	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
,4,6-Trichlorophenol	< 300	ug/Kg	300	08/07/01	SAS	SW846-8270B
Arsenic by ICP	6.7	mg/Kg	0.3	08/10/01	NMW	SW846-6010A
arium by ICP	71	mg/Kg	0.1	08/10/01	NMW	SW846-6010A
admium by ICP	<0.1	mg/Kg	0.1	08/10/01	NMW	SW846-6010A
Chromium by ICP	20	mg/Kg	0.1	08/10/01	NMW	SW846-6010A
lercury in solids	0.02	mg/Kg	0.02	08/03/01	BRW	SW846-7470
ead by ICP	16	mg/Kg	0.2	08/10/01	NMW	SW846-6010A
Silver by ICP	<0.1	mg/Kg	0.1	08/10/01	NMW	SW846-6010A
elenium by ICP	0.4	mg/Kg	0.3	08/10/01	NMW	SW846-6010A
ntimony by GFAA	<0.5	mg/Kg	0.004	08/08/01	STL	EPA 204.2
Arsenic by GFAA	6.0	mg/Kg	0.005	08/08/01	STL	EPA 206.2
hallium by GFAA	<1.0	mg/Kg	0.001	08/08/01	STL	EPA 279.2
hallium by ICP	<0.4	mg/Kg	0.4	08/10/01	NMW	SW846-6010A
Reactive Cyanide	<10	mg/Kg	10	08/03/01	CGM	SW846Chpt7.3
elenium by GFAA	<0.5	mg/Kg	0.005	08/08/01	STL	EPA 270.2
roclor 1016	< 0.25	mg/Kg	0.25	08/07/01	DEN	SW846-8082
Aroclor 1221	< 0.25	mg/Kg	0.25	08/07/01	DEN	SW846-8082

Phone: (812) 464-9000 *Fax: (812) 424-0667* *csastl@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Sample ID#: **NN05580**

Your Reference: ACS GRIFFITH, IN
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Aroclor 1232	< 0.25	mg/Kg	0.25	08/07/01	DEN	SW846-8082
Aroclor 1242	< 0.25	mg/Kg	0.25	08/07/01	DEN	SW846-8082
Aroclor 1248	< 0.25	mg/Kg	0.25	08/07/01	DEN	SW846-8082
Aroclor 1254	< 0.25	mg/Kg	0.25	08/07/01	DEN	SW846-8082
Aroclor 1260	< 0.25	mg/Kg	0.25	08/07/01	DEN	SW846-8082
Total PCBs	< 0.25	mg/Kg	0.25	08/07/01	DEN	SW846-8082
Lead by GFAA	14.0	ug/Kg	1	08/08/01	STL	SW846-7421

Reviewed and Approved By:

Rodger Wilson

Phone: (812) 464-9000 *Fax: (812) 424-0667* *csastl@aol.com*

APPENDIX E

Geotechnical Field and Laboratory Testing Results of Borrow Source Material (Great Lakes)

Great Lakes
Soil & Environmental Consultants, Inc.

333 Shore Drive
Burr Ridge, IL 60521
Ph: (630) 321-0944
Fax: (630) 321-0945
www.greatlakessoil.com

Engineering, soil and material testing

October 2, 2001

Ms. Erin Blakenberger
Koester Environmental Services
14649 Highway 41North
Evansville, IN 47725

Subject: Laboratory and Field Testing Services-ACS Superfund Site, Griffith, IN

Dear Ms. Blankenberger:

Thank you for selecting Great Lakes Soil & Environmental Consultants, Inc. (GLSEC) is pleased to submit the enclosed test reports for the above-referenced project.

The following test reports are included.

Appendix	
A	Compaction test reports
B	Proctor Tests
C	Grain-size and Atterberg
D	Percent Fines
E	Specific Gravity
F	Hydraulic Conductivity

GLSEC highly appreciates the opportunity to be of service to Koester Environmental Services. If you have any questions about this report, please feel free to call us at 630-321-0944.

Thank you.

Sincerely,
Great Lakes Soil & Environmental Consultants, Inc.

Sanjeev Bandi, Ph.D., P.E.
Principal Engineer

Encl.

APPENDIX A

FIELD COMPACTION TEST REPORTS

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	~~[illegible]~~ K								
File No.	2147	Date	8-3-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		SHEEPSFOOT		Gauge Serial No.	24390			Specification, % M	16-5

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		NON-ENGINEERED AREA 1	GRADE	CLAY	+2		113.0	15.7	113.5	99.6	PASS
1		NON-ENGINEERED AREA 1	GRADE	CLAY	12		112.1	15.1	113.5	98.8	PASS
1		" " " "	GRADE	CLAY	12		114.1	15.3	113.5	100.5	PASS
1		" " " "	5"/1	CLAY	12		107.9	14.4	113.5	95.1	PASS
1		" " " "	GRADE	CLAY	12		108.1	17.5	113.5	95.2	PASS
1		" " " "	5"/1	CLAY	12		108.0	17.7	113.5	95.2	PASS
1		" " " "	5"/1	CLAY	12		104.1	15.2	113.5	91.7	FAIL
1		" " " "	5"/1	CLAY	12		114.5	14.4	113.5	100.9	PASS
1		" " " "	5"/1	CLAY	12		117.3	14.9	113.5	103.3	PASS
1		" " " "	5"/1	CLAY	6		111.7	14.8	113.5	98.4	PASS
1		" " " "	5"/1	CLAY	6		107.9	14.6	113.5	95.1	PASS
1		" " " "	5"/1	CLAY	6		108.7	16.0	113.5	95.8	PASS
2	1	" " " "	5"/1	CLAY	6		110.8	14.5	113.5	97.6	PASS

Remarks:					
Field Technician Signature		QC by:	SB	Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CASTMORE								
Client:	~~[illegible]~~ ~~[illegible]~~ KOESTER								
File No.	2147	Date	8-6-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		~~Proc~~ SHEEPSFOOT		Gauge Serial No.	24380			Specification, % M	16.5

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 71	12"/1	CLAY	12		108.4	8.9	113.5	95.5	PASS
1		STA 63		CLAY	12		115.7	9.5	113.5	101.9	
1		STA 54		CLAY	12		117.5	7.0	113.5	103.5	
1		STA 26		CLAY	12		114.7	10.7	~~108.5~~ 113.5	101.1	
1		STA 8		CLAY	12		113.8	13.6	113.5	100.3	~~FAIL~~
1		STA 17		CLAY	12		114.2	9.1	113.5	100.6	
1		STA 27		CLAY	12		115.1	8.9	113.5	101.4	
1		STA 55		CLAY	12		113.4	8.5	113.5	99.9	
1		STA 23		CLAY	12		115.0	9.0	113.5	101.3	
1		STA 64		CLAY	12		114.9	9.3	113.5	101.2	
1		STA 45		CLAY	12		114.5	8.2	113.5	100.9	
1		STA 35		CLAY	12		122.9	11.9	113.5	108.3	
1		STA 44		CLAY	12		120.2	7.9	113.5	105.9	
1		STA 53		CLAY	12		119.8	8.4	113.5	105.6	
1		STA 72	↓	CLAY	12		118.2	10.3	113.5	104.4	↓

Remarks: * MOISTURE DID NOT PASS BUT WAS O.K. BY CLIENT

Field Technician Signature: [signature] QC by: SB Date:

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	KOESTER								
File No.	2147	Date	8-7-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		SHEEPSFOOT		Gauge Serial No.	24390			Specification, % M	16.5

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail	
1		STA 6	6"/2	CLAY	6		97.9	9.9	113.5	86.3	FAIL	
1		STA 6	6"/1	CLAY	12		98.5	10.1	113.5	86.8	FAIL	
1		STA 24	6"/2	CLAY	6		95.3	11.0	113.5	84.0	FAIL	
1		STA 24	6"/1	CLAY	12		103.6	10.6	113.5	91.3	FAIL	
1		STA 33	6"/2	CLAY	6		96.9	10.6	113.5	85.4	FAIL	
1		STA 33	6"/1	CLAY	12		111.3	10.3	113.5	98.1	FAIL	M
1		STA 25	6"/2	CLAY	6		100.0	11.4	113.5	88.1	FAIL	
1		STA 25	6"/1	CLAY	12		100.5	14.1	113.5	88.5	FAIL	
1		STA 7	6"/2	CLAY	6		112.5	11.0	113.5	99.1	FAIL	M
1		STA 7	6"/1	CLAY	12		113.6	11.3	113.5	100.1	FAIL	M
1		STA 15	6"/2	CLAY	6		108.9	9.9	113.5	95.9	FAIL	M
1		STA 15	6"/1	CLAY	12		110.0	9.2	113.5	96.9	FAIL	M
1		STA 16	6"/2	CLAY	6		114.7	14.9	113.5	101.1	PASS	
1		STA 16	6"/1	CLAY	12		114.9	15.0	113.5	101.2	PASS	
1		STA 34	6"/2	CLAY	6		111.5	9.9	113.5	98.2	FAIL	M
1		STA 34	6"/1	CLAY	12		116.5	11.4	113.5	102.6	FAIL	M
1		STA 43	6"/2	CLAY	6		101.6	9.5	113.5	89.5	FAIL	
1		STA 43	6"/1	CLAY	12		101.0	11.0	113.5	89.0	FAIL	
1		STA 62	6"/2	CLAY	6		103.3	10.0	113.5	91.0	FAIL	
1		STA 62	6"/1	CLAY	12		102.0	9.4	113.5	89.9	FAIL	

Remarks:	M = PASSED DENSITY FAILED MOISTURE				
Field Technician Signature		QC by:	BS	Date:	

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	FOESTER								
File No.	247	Date	8-7-01	Report No.		Page No.	2	Specification, % PR	95
Equipment Used for Compaction		SHEEPS FOOT		Gauge Serial No.	24390			Specification, % M	16.5

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 70	6"/2	CLAY	6		108.2	15.7	113.5	95.3	PASS
1		STA 70	6"/1	CLAY	12		108.4	16.5	113.5	95.5	PASS
1		STA 80	6"/2	CLAY	6		102.2	10.2	113.5	90.0	FAIL
1		STA 80	6"/1	CLAY	12		104.0	9.4	113.5	91.6	FAIL

Remarks:					
Field Technician Signature		QC by:	SB	Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	KOESTER								
File No.	2147	Date	8-8-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		STEEL FOOT		Gauge Serial No.	24380			Specification, % M	16.5

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 79		CLAY	6		110.6	17.2	113.5	97.4	PASS
1		STA 85		CLAY	6		112.0	16.9	113.5	98.7	PASS
1		STA 78		CLAY	6		108.9	18.4	113.5	95.9	PASS
1		STA 80		CLAY	4		110.5	17.1	113.5	97.4	PASS
1		STA 90		CLAY	12		109.1	16.6	113.5	96.1	PASS
1		STA 86		CLAY	4		108.3	18.5	113.5	95.4	PASS
1		STA 86		CLAY	10		110.9	17.1	113.5	97.8	PASS
1		STA 70		CLAY	6		110.1	16.7	113.5	97.0	PASS
1		STA 92		CLAY	6		109.8	17.1	113.5	96.7	PASS
1		STA 62		CLAY	12		110.2	16.8	113.5	97.1	PASS
1		~~STA 52~~ STA 52		CLAY	6		108.4	18.5	113.5	95.5	PASS
1		STA 52		CLAY	12		108.7	18.4	113.5	95.8	PASS
1		STA 42		CLAY	6		111.6	17.1	113.5	98.3	PASS
1		STA 42		CLAY	12		112.4	16.9	113.5	99.0	PASS
1		STA 61		CLAY	6		114.0	16.6	113.5	100.4	PASS
1		STA 61		CLAY	12		116.0	16.9	113.5	102.2	PASS
1		STA 84		CLAY	4		111.9	17.2	113.5	98.6	PASS
1		STA 25		CLAY	6		117.1	16.7	113.5	103.2	PASS
1		STA 33		CLAY	6		110.2	17.1	113.5	97.1	PASS
1		STA 33		CLAY	12		113.7	17.0	113.5	100.2	PASS

Remarks:					
Field Technician Signature		QC by:	SB	Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	~~ATKINS~~ KOESTER								
File No.	2147	Date	8-8-01	Report No.		Page No.	2	Specification, % PR	95
Equipment Used for Compaction		~~SAKAI~~ SHEEPSFOOT		Gauge Serial No.	24390			Specification, % M	16.5

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 43		CLAY	6		107.9	18.5	113.5	95.1	PASS
1		STA 43		CLAY	12		108.6	18.3	113.5	95.7	PASS
1		STA 53		CLAY	6		109.0	16.9	113.5	96.0	PASS
1		STA 53		CLAY	12		110.1	16.8	113.5	97.0	PASS
1		STA 44		CLAY	6		113.7	17.2	113.5	100.2	PASS
1		STA 44		CLAY	12		112.9	16.6	113.5	99.5	PASS
1		STA 26		CLAY	6		109.1	16.9	113.5	96.1	PASS
1		STA 26		CLAY	12		109.9	16.7	113.5	96.8	PASS
1		STA 34		CLAY	6		109.5	17.7	113.5	96.5	PASS
1		STA 54		CLAY	12		109.3	16.7	113.5	96.3	PASS
1		STA 63		CLAY	6		111.8	16.9	113.5	98.5	PASS
1		STA 63		CLAY	12		112.1	16.5	113.5	98.8	PASS
1		STA 54		CLAY	12		107.9	17.3	113.5	95.1	PASS
1		STA 54		CLAY	12		108.4	17.0	113.5	95.5	PASS
1		STA 35		CLAY	6		108.9	16.9	113.5	95.9	PASS
1		STA 35		CLAY	12		109.0	16.6	113.5	96.0	PASS

Remarks:					
Field Technician Signature		QC by:	SB	Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	KOESTER								
File No.	2147	Date	8-9-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		SHEEPSFOOT		Gauge Serial No.	24390			Specification, % M	165

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 72		CLAY	6		109.1	17.2	113.5	96.1	PASS
1		STA 72		CLAY	12		110.9	16.9	113.5	97.7	PASS
1		STA 45		CLAY	6		107.9	17.3	113.5	95.1	PASS
1		STA 45		CLAY	12		107.1	18.1	113.5	96.1	PASS
1		STA 27		CLAY	6		108.3	16.9	113.5	95.4	PASS
1		STA 27		CLAY	12		108.9	16.6	113.5	95.9	PASS
1		STA 17		CLAY	6		112.1	16.8	113.5	98.8	PASS
1		STA 17		CLAY	12		114.6	16.5	113.5	101.0	PASS
1		STA 64		CLAY	6		108.5	16.7	113.5	95.6	PASS
1		STA 64		CLAY	12		113.6	16.7	113.5	100.0	PASS
1		STA 71		CLAY	6		112.7	17.1	113.5	99.3	PASS
1		STA 71		CLAY	12		113.4	16.9	113.5	100.0	PASS
1		STA 55		CLAY	6		110.1	16.9	113.5	97.0	PASS
1		STA 55		CLAY	12		111.4	16.6	113.5	98.1	PASS
1		STA 73		CLAY	6		109.7	17.5	113.5	96.7	PASS
1		STA 73		CLAY	12		110.4	17.0	113.5	97.3	PASS
1		STA 20		CLAY	4		112.5	17.5	113.5	99.1	PASS
1		STA 29		CLAY	4		110.1	16.6	113.5	97.0	PASS
1		STA 30		CLAY	4		107.8	16.8	113.5	95.0	PASS

Remarks:				
Field Technician Signature		QC by:		Date:

Quality, Service & Commitment

110 18.5

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	KOESTER								
File No.	2147	Date	8-10-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		ROLLER		Gauge Serial No.	24390			Specification, % M	16.5

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 32		CLAY	4		108.9	18.2	113.5	95.9	PASS
1		STA 31		CLAY	4		108.3	16.7	113.5	95.4	PASS
1		STA 30		CLAY	4		108.7	17.9	113.5	95.8	PASS
1		STA 29		CLAY	4		109.5	17.4	113.5	96.5	PASS
1		STA 28		CLAY	4		108.7	17.0	113.5	95.8	PASS

Remarks:					
Field Technician Signature		QC by:		Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	KOESTER								
File No.	2147	Date	8-10-01	Report No.		Page No.	2	Specification, % PR	95.0
Equipment Used for Compaction		ROLLER		Gauge Serial No.	24390			Specification, % M	170

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 24		CLAY	6		106.4	17.4	110	96.7	PASS
1		STA 24		CLAY	10		107.2	17.3	110	97.5	PASS
1		STA 23		CLAY	6		104.9	17.8	110	95.4	PASS
1		STA 23		CLAY	10		106.6	17.4	110	96.9	PASS
1		STA 22		CLAY	6		108.7	17.1	110	98.8	PASS
1		STA 22		CLAY	10		114.2	17.1	110	103.8	PASS
1		STA 15		CLAY	6		112.0	17.4	110	102.5	PASS
1		STA 15		CLAY	10		105.2	18.1	110	95.6	PASS
1		STA 14		CLAY	6		108.2	17.3	110	98.4	PASS
1		STA 14		CLAY	10		106.5	17.4	110	96.8	PASS
1		STA 13		CLAY	6		105.5	17.1	110	95.9	PASS
1		STA 13		CLAY	10		106.2	17.8	110	96.5	PASS
1		STA 7		CLAY	6		104.9	17.2	110	95.4	PASS
1		STA 7		CLAY	10		105.7	17.6	110	96.1	PASS
1		STA 6		CLAY	6		106.3	18.2	110	96.6	PASS
1		STA 6		CLAY	10		105.9	17.8	110	96.3	PASS
1		STA 5		CLAY	6		107.2	17.6	110	97.5	PASS
1		STA 5		CLAY	10		109.1	17.5	110	99.2	PASS

Remarks:					
Field Technician Signature		QC by:		Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	KOESTER								
File No.	2147	Date	8-10-01	Report No:		Page No.	3	Specification, % PR	95
Equipment Used for Compaction		ROLLER		Gauge Serial No.				Specification, % M	17

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 4		CLAY	6		110.2	17.7	110	100.2	PASS
1		STA 4		CLAY	10		108.8	17.6	110	98.9	PASS
1		STA 3		CLAY	6		109.8	17.1	110	99.8	PASS
1		STA 3		CLAY	10		111.6	17.0	110	101.5	PASS
1		STA 2		CLAY	6		107.6	17.3	110	97.8	PASS
1		STA 2		CLAY	10		107.7	17.5	110	97.9	PASS
1		STA 12		CLAY	6		105.1	17.3	110	95.5	PASS
1		STA 12		CLAY	10		104.8	18.1	110	95.3	PASS
1		STA 11		CLAY	6		107.2	17.4	110	97.5	PASS
1		STA 11		CLAY	10		110.0	17.1	110	100.0	PASS
1		STA 10		CLAY	6		107.3	17.4	110	97.5	PASS
1		STA 10		CLAY	10		111.6	17.2	110	101.5	PASS
1		STA 20		CLAY	6		108.1	17.4	110	98.3	PASS
1		STA 20		CLAY	10		110.6	17.3	110	100.5	PASS
1		STA 21		CLAY	6		110.0	18.0	110	100.0	PASS
1		STA 21		CLAY	10		110.0	17.9	110	100.0	PASS

Remarks:					
Field Technician Signature		QC by:	SDS	Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	KOESTER								
File No.	ZH17	Date	8-13-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		ROLLER		Gauge Serial No.	ZH390			Specification, % M	17.0

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 49		CLAY	4		111.9	17.8	110	101.7	PASS
1		STA 39		CLAY	4		110.2	17.3	110	100.2	PASS
1		STA 49		CLAY	4		105.3	18.9	110	95.7	PASS
1		STA 58		CLAY	4		108.7	17.9	110	98.8	PASS
1		STA 38		CLAY	6		109.0	17.6	110	99.1	PASS
1		STA 57		CLAY	6		108.3	17.9	110	98.5	PASS
1		STA 47		CLAY	6		105.9	17.7	110	96.3	PASS
1		STA 64	6"/2	CLAY	6		109.3	17.2	110	99.3	PASS
1		STA 63	6"/2	CLAY	6		113.1	17.5	110	102.8	PASS
1		STA 62	6"/2	CLAY	6		106.5	18.8	110	96.8	PASS
1		STA 55	6"/2	CLAY	6		108.9	17.6	110	99.0	PASS
1		STA 54	6"/2	CLAY	6		107.5	17.4	110	97.7	PASS
1		STA 53	6"/2	CLAY	6		106.0	17.4	110	97.1	PASS

Remarks:					
Field Technician Signature		QC by:	STB	Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	American Chemical								
Client:	KOESTER								
File No.	2205	Date	8-14	Report No.		Page No.		Specification, % PR	95
Equipment Used for Compaction		ROLLER		Gauge Serial No.	24390			Specification, % M	17.4 ± 2

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		SOUTH ~~SIDE~~ #26	f. GRADE	BR. si. clay	-6"		107.8	17.4	110.0	98.0	PASS
2		#34			6"		107.5	17.6		97.7	
3		#35			6"		106.6	17.9		96.9	
4		#45			6"		105.2	18.4		95.6	
5		#53			6"		108.0	17.2		98.2	
6		#54			6"		108.8	17.4		98.9	
7		#62			6"		105.8	18.3		96.1	
8		#63			6"		105.3	18.2		95.6	

Remarks:					
Field Technician Signature	AK	QC by:	SB	Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	ROESTER								
File No.	2147	Date	8-22-01	Report No.		Page No.	1	Specification, % PR	95.0
Equipment Used for Compaction		SMOOTH VIBRATING Roller		Gauge Serial No.	00089			Specification, % M	17.0

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 66	#2	DARK BROWN CLAY	6	124.6	109.8	19.78	110.0	96.2	PASS
2		STA 88	#1	W/TRACE GRAVEL	6	123.9	104.8	18.27	110.0	95.2	PASS
3		STA 92	#1		6	127.5	107.6	18.54	110.0	97.8	PASS
4		STA 87	#1		6	124.6	105.5	18.10	110.0	95.9	PASS
5		STA 60	#1		4	124.7	105.9	17.65	110.0	96.3	
6		STA 77	#2		6	128.8	110.0	17.10	110.0	100.0	

Remarks:					
Field Technician Signature		QC by:		Date:	8-22

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	American Chemical								
Client:	Koester								
File No.	2147	Date	8-24-01	Report No.		Page No.	1 of 1	Specification, % PR	95.0
Equipment Used for Compaction		Roller		Gauge Serial No.	Troxler			Specification, % M	17.0

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		Sta: 50	F.G.	CLAY	4	–	104.6	17.7	110.0	95.0	PASS
2		Sta: 59	"	"	4	–	104.6	18.6	"	95.0	"
3		Sta: 68	"	"	4	–	109.1	16.9	"	99.2	"
4		Sta: 83	"	"	6	–	105.7	17.4	"	96.0	"
5		Sta: 40	"	"	4	–	106.0	18.2	"	96.3	"
6		Sta: 41	"	"	4	–	105.4	18.5	"	95.8	"
7		Sta: 51	"	"	4	–	107.6	17.3	"	97.9	"
8		Sta: 30	"	"	6	–	108.1	16.9	"	98.3	"
9		Sta: 57	"	"	6	–	105.8	17.4	"	96.2	"
10		Sta: 75	"	"	6	–	104.6	17.0	"	95.0	"

Remarks:					
Field Technician Signature	Terry L. Buck	QC by:	SB	Date:	

Quality, Service & Commitment

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	American Chemical Griffith In.								
Client:	Koester								
File No.	2147	Date	8-27-01	Report No.		Page No.	1 of 1	Specification, % PR	95%
Equipment Used for Compaction		Roller		Gauge Serial No.	Troxler			Specification, % M	17 + 0 to 2%

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		Sta: 56	F.G	CLAY	12.0	-	108.0	17.4	110.0	98.1	Pass
2		Sta: 37	F.G.	CLAY	6.0	-	106.5	18.1	110.0	96.8	Pass

Remarks:					
Field Technician Signature	Terry L Beck	QC by:	SB	Date:	

Quality, Service & Commitment

APPENDIX B

PROCTOR TESTS

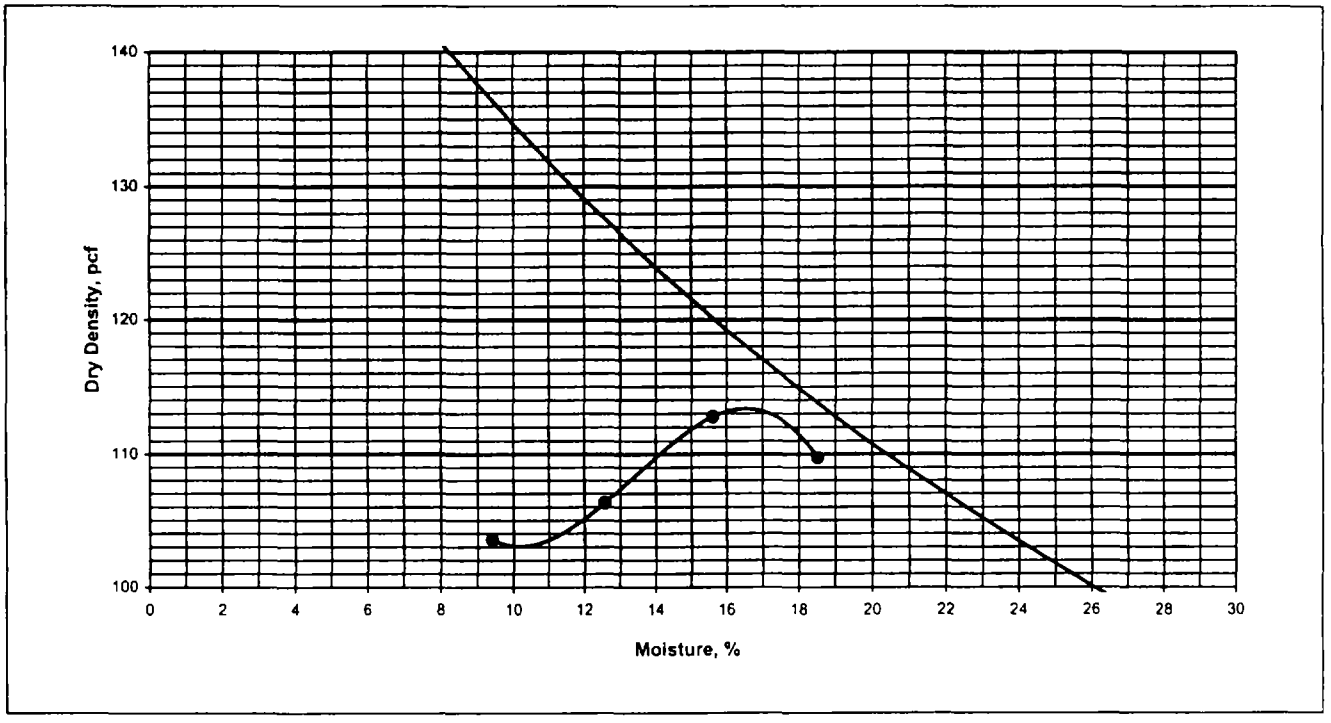
Great Lakes Soil & Environmental Consultants Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

MOISTURE - DENSITY RELATIONSHIP CURVE

ASTM D698-91

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File No.	2205	**Sample #**	BS-1	**Date Tested**	7/24/2001	**Tested By**	SR
						Qc By	SB

Sample Location									
Sample Description	Brown silty clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**		25					



Zero Air Void Curve Specific Gravity: 2.75

Results

Maximum Dry Density, pcf	113.5	**Optimum Moisture Content, %**	16.5	**Natural Moisture Content, %**	9.5

Remarks

Great Lakes Soil & Environmental Consultants Inc.

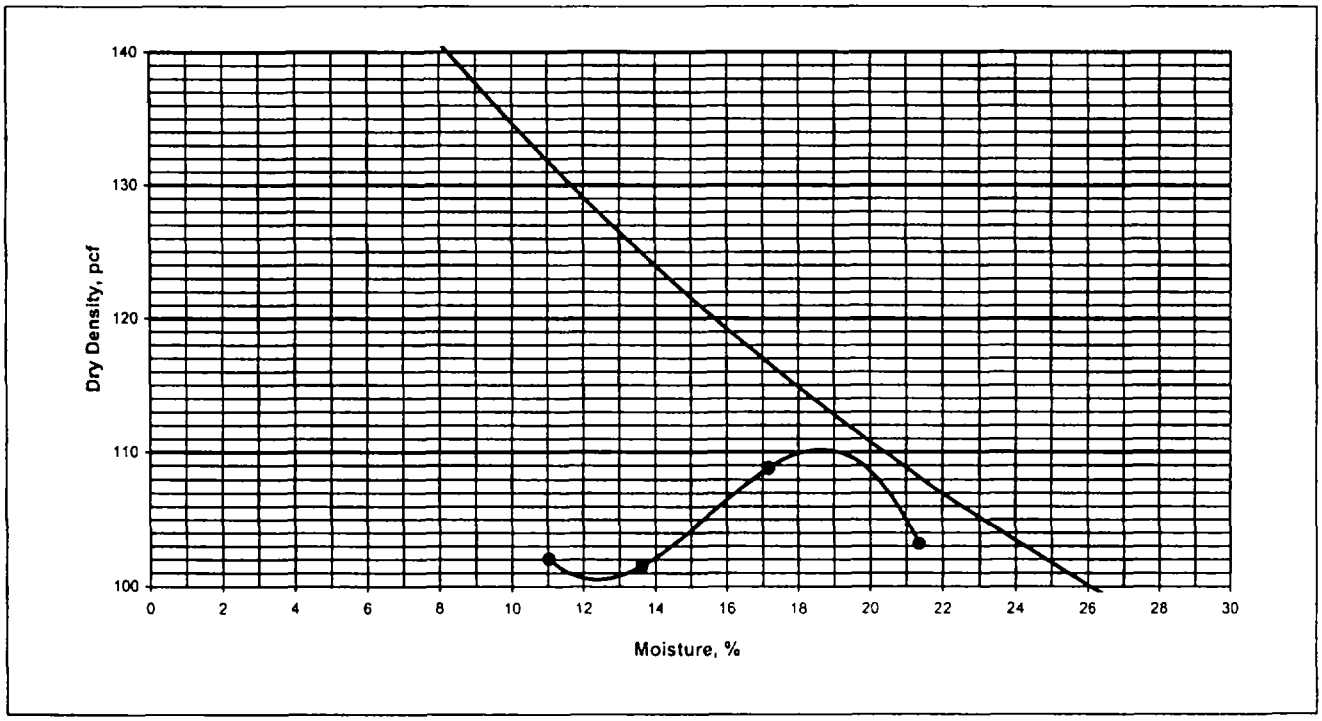
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

MOISTURE - DENSITY RELATIONSHIP CURVE

ASTM D698-91

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File No.	2205	**Sample #**	BS-2	**Date Tested**	8/9/2001	**Tested By**	AM
						Qc By	SB

Sample Location									
Sample Description	Browish gray silty clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**		25					



Zero Air Void Curve Specific Gravity: 2.75

Results

Maximum Dry Density, pcf	110.0	**Optimum Moisture Content, %**	18.5	**Natural Moisture Content, %**	

Remarks

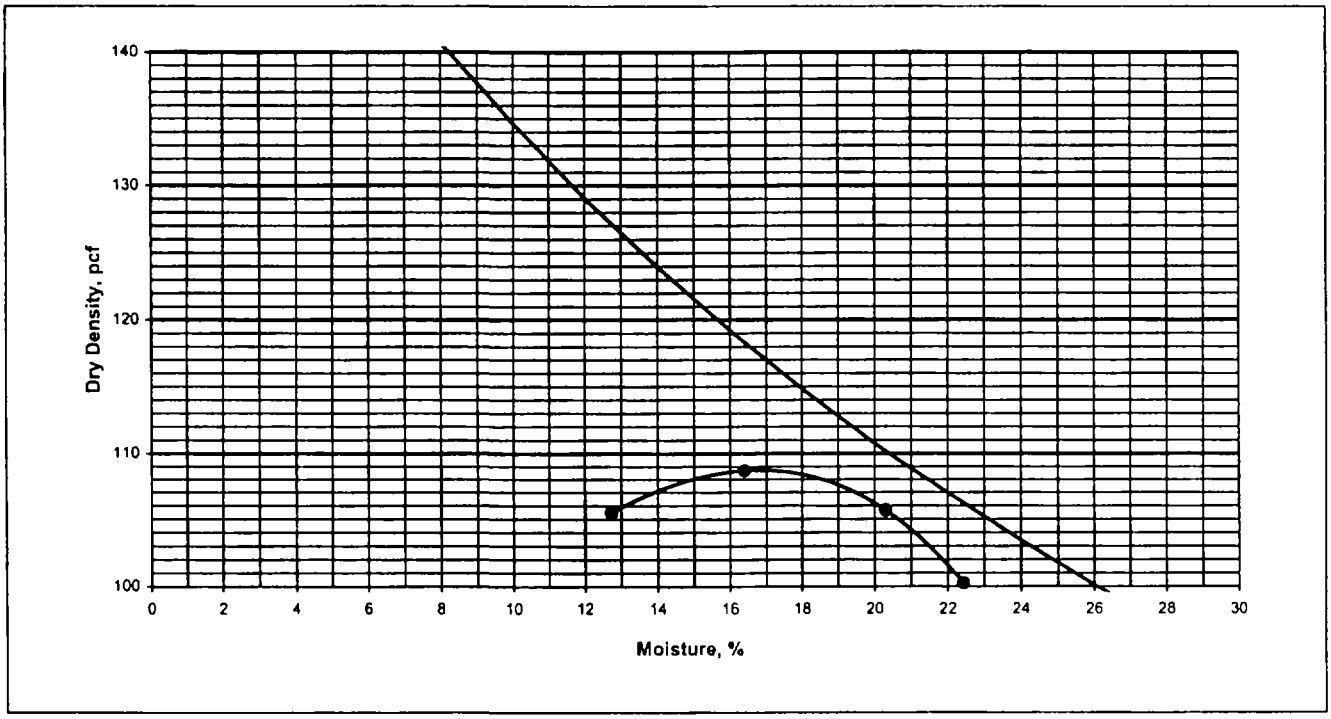
Great Lakes Soil & Environmental Consultants Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

MOISTURE - DENSITY RELATIONSHIP CURVE

ASTM D698-91

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File No.	2205	**Sample #**	BS-3	**Date Tested**	8/9/2001	**Tested By**	AM
						Qc By	SB

Sample Location									
Sample Description	Brownis gray silty clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, In.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**		25					



Zero Air Void Curve Specific Gravity: 2.75

Results

Maximum Dry Density, pcf	109.0	**Optimum Moisture Content, %**	17.0	**Natural Moisture Content, %**	

Remarks

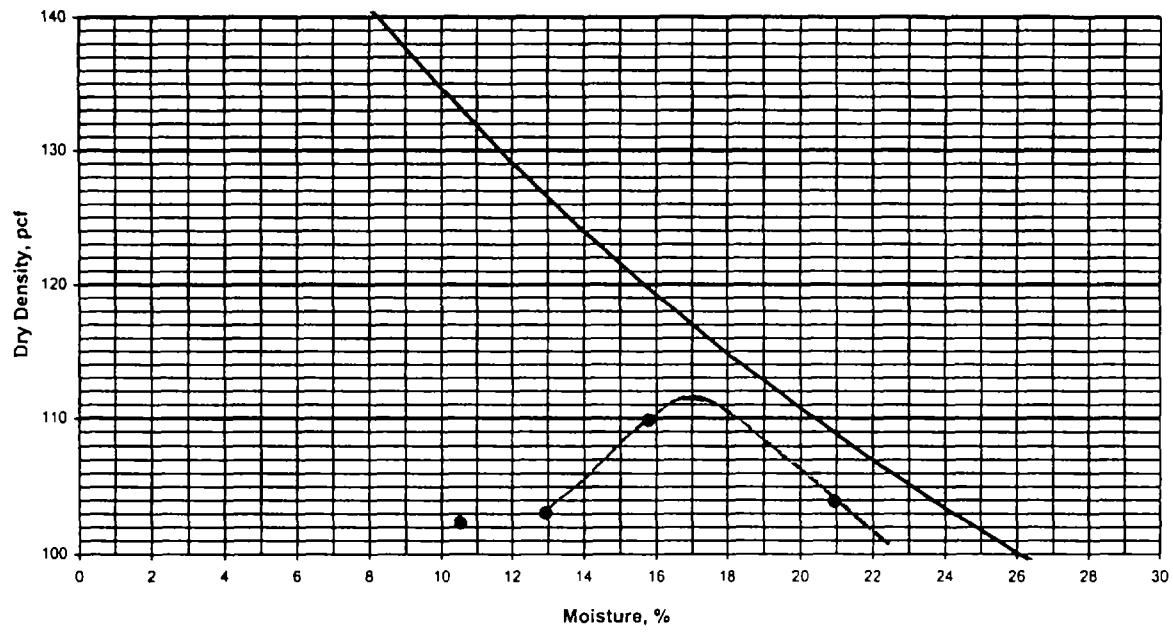
Great Lakes Soil & Environmental Consultants Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

MOISTURE - DENSITY RELATIONSHIP CURVE

ASTM D698-91

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File No.	2205	**Sample #**	BS-4	**Date Tested**	8/9/2001	**Tested By**	AM
						Qc By	SB

Sample Location									
Sample Description	Brownish gray silty clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**		25					



Zero Air Void Curve Specific Gravity: 2.75

Results

Maximum Dry Density, pcf	111.5	**Optimum Moisture Content, %**	17.0	**Natural Moisture Content, %**	

Remarks

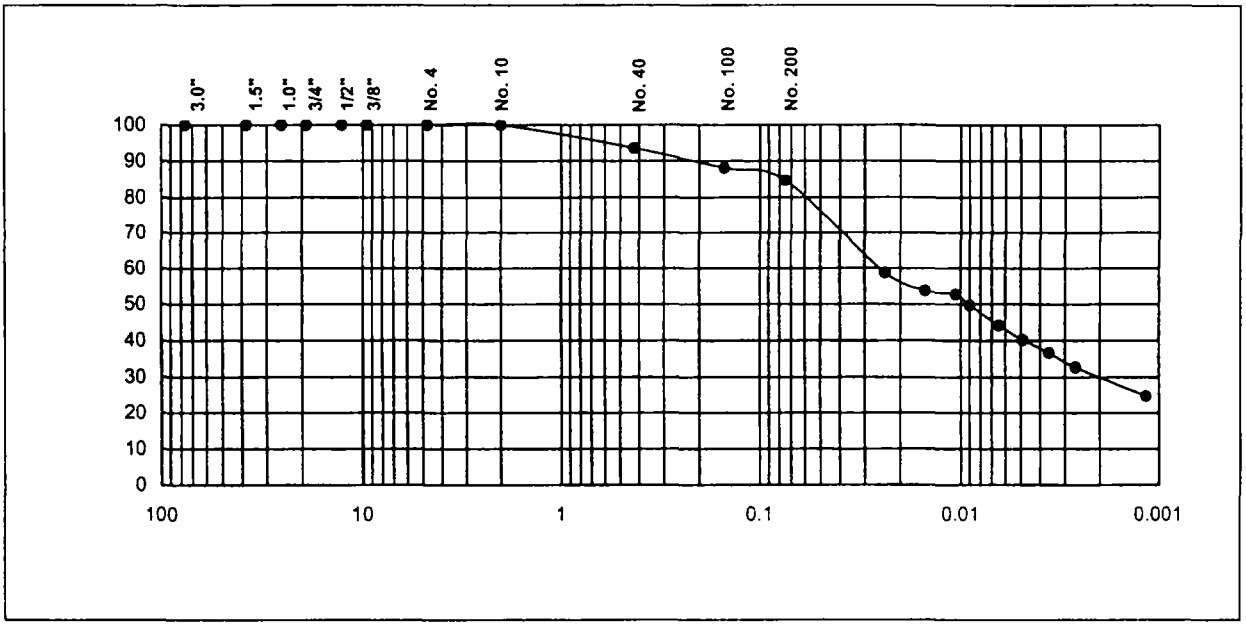
APPENDIX C

GRAIN SIZE AND ATTERBERG LIMITS

Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	GRAIN SIZE ANALYSIS (ASTM D422)

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File No.	2205	**Sample #**	BS-1	**Date Tested**	7/25/2001	**Tested by**	AK
						Qc by	SB

Sample Location	
Sample Description	Brown silty clay



% + 3"	% Gravel	% Sand	% Silt	% Clay
0.0	0.0	15.4	44.3	40.3

Sieve Size	Percent Passing
3.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	100.0
3/8"	100.0
No. 4	100.0
No. 10	100.0
No. 40	93.5
No. 100	88.1
No. 200	84.6

Liquid Limit, L_L	Plastic Limit, PL	Plasticity Index, PI
30	15	15

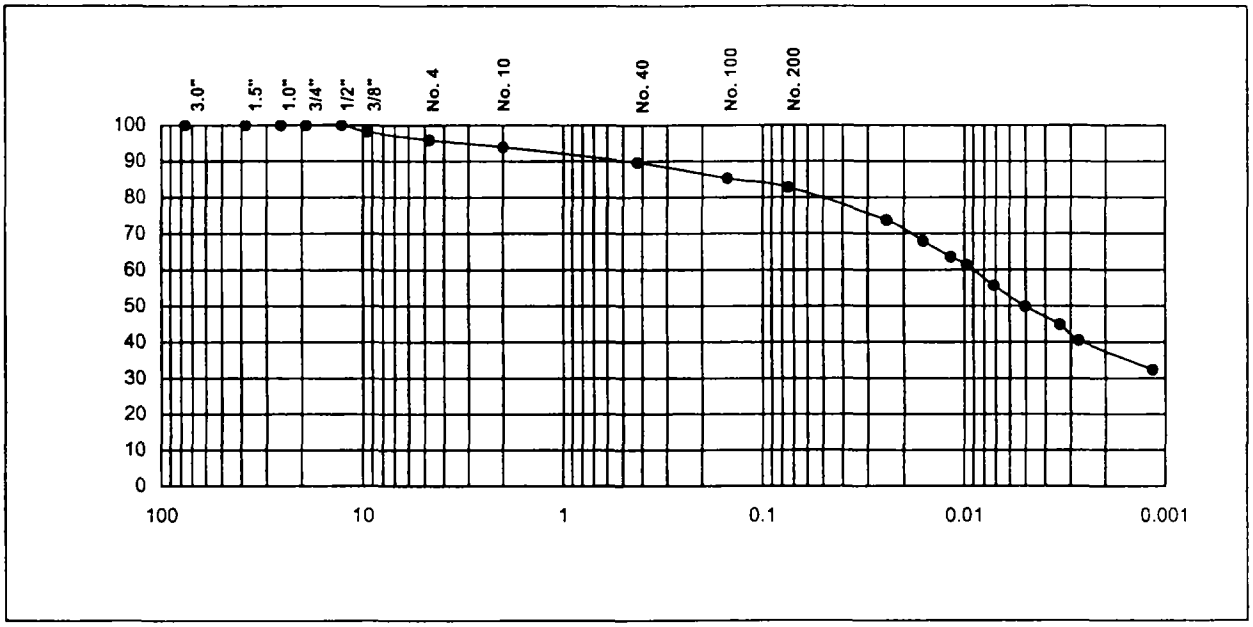
Soil Classification:	CL
Soil Description:	Lean Clay with Sand
System:	USCS

Remarks:

Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	GRAIN SIZE ANALYSIS (ASTM D422)

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File No.	2205	**Sample #**	2	**Date Tested**	8/14/2001	**Tested by**	AK
						Qc by	SB

Sample Location	
Sample Description	Brown silty clay



% + 3"	% Gravel	% Sand	% Silt	% Clay
0.0	4.1	13.1	33.3	49.5

Sieve Size	Percent Passing
3.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	100.0
3/8"	98.2
No. 4	95.9
No. 10	93.9
No. 40	89.6
No. 100	85.2
No. 200	82.8

Liquid Limit, L_L	Plastic Limit, PL	Plasticity Index, PI
37	18	19

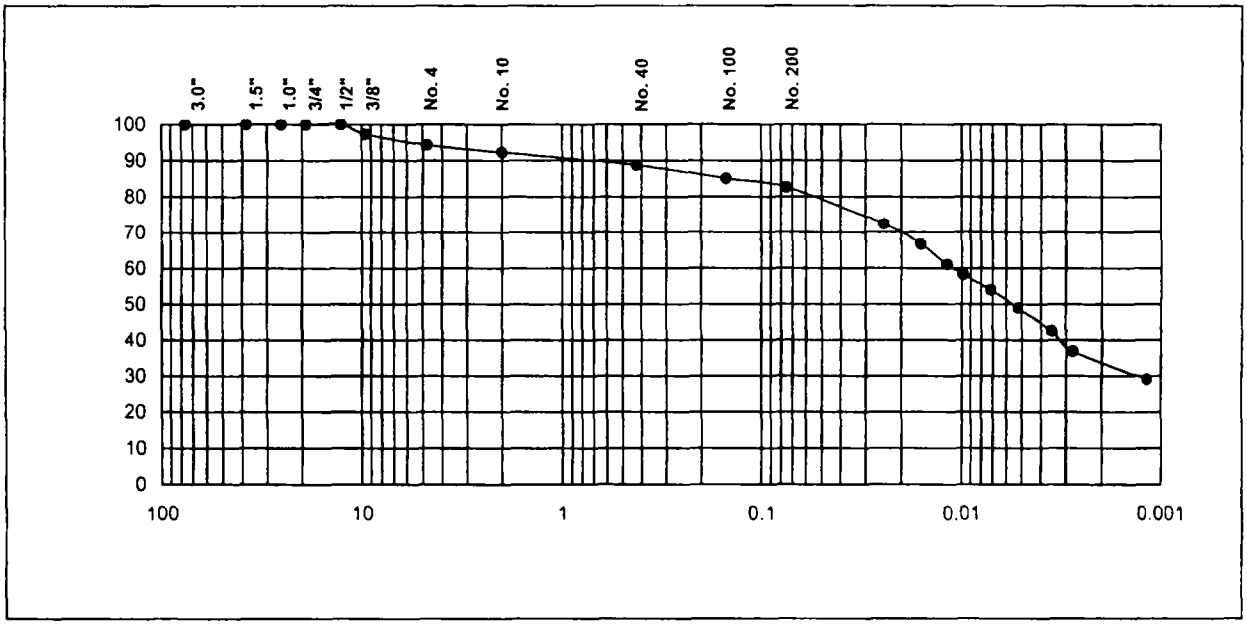
Soil Classification:	CL
Soil Description:	Lean Clay with Sand
System:	USCS

Remarks:

Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	GRAIN SIZE ANALYSIS (ASTM D422)

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File No.	2205	**Sample #**	3	**Date Tested**	8/14/2001	**Tested by**	AK
						Qc by	SB

Sample Location	
Sample Description	Brown silty clay



% + 3"	% Gravel	% Sand	% Silt	% Clay
0.0	5.7	11.7	35.2	47.4

Sieve Size	Percent Passing
3.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	100.0
3/8"	97.3
No. 4	94.3
No. 10	92.3
No. 40	88.8
No. 100	85.0
No. 200	82.6

Liquid Limit, L_L	Plastic Limit, PL	Plasticity Index, PI
34	17	17

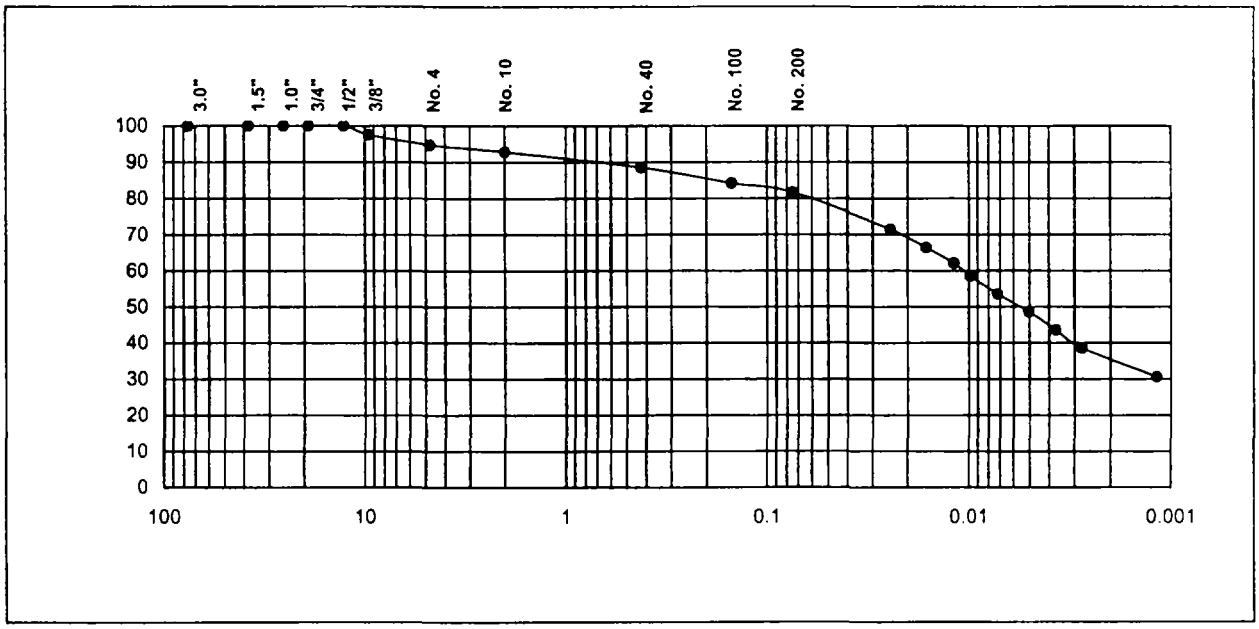
Soil Classification:	CL
Soil Description:	Lean Clay with Sand
System:	USCS

Remarks:

Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	GRAIN SIZE ANALYSIS (ASTM D422)

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File No.	2205	**Sample #**	4	**Date Tested**	8/14/2001	**Tested by**	AK
						Qc by	SB

Sample Location	
Sample Description	Brown silty clay



% + 3"	% Gravel	% Sand	% Silt	% Clay
0.0	5.2	13.1	34.1	47.6

Sieve Size	Percent Passing
3.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	100.0
3/8"	97.6
No. 4	94.8
No. 10	92.8
No. 40	88.6
No. 100	84.2
No. 200	81.7

Liquid Limit, L_L	Plastic Limit, PL	Plasticity Index, PI
33	17	16

Soil Classification:	CL
Soil Description:	Lean Clay with Sand
System:	USCS

Remarks:

APPENDIX D

PERCENT FINES

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive Burr Ridge, IL 60521 Ph: 630-321-0944 Fax: 630-321-0945

PERCENT FINES
ASTM D1140

Project	ACS Superfund Site-Field and laboratory testing services						
Client	Koester Environmental Services **14649** Highway 41 North, Griffith, IN 47725, Attn: Jeff Wickham						
File No.	2205	Date	BS-1	Sample #	8/2/2001	Tested By	AK

Source of Material	
Description of Soil	Brown Silty Clay

Control Sieve No.	=	# 200	
Weight dry sample	=	1000	g
Weight of dry sample after washing	=	180	g
Percent fines, %	**=**	**82.0**	

Remarks	

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive Burr Ridge, IL 60521 Ph: 630-321-0944 Fax: 630-321-0945

PERCENT FINES
ASTM D1140

Project	ACS Superfund Site-Field and laboratory testing services						
Client	Koester Environmental Services 14649 Highway 41 North, Griffith, IN 47725, Attn: Erin Blankenberger						
File No.	2205	Date	BS-2	Sample #	8/23/2001	Tested By	AK

Source of Material	
Description of Soil	Brown Silty Clay

Control Sieve No.	=	# 200	
Weight dry sample	=	500	g
Weight of dry sample after washing	=	86.7	g
Percent fines, %	=	**82.7**	

Remarks	

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive Burr Ridge, IL 60521 Ph: 630-321-0944 Fax: 630-321-0945

PERCENT FINES
ASTM D1140

Project	ACS Superfund Site-Field and laboratory testing services						
Client	Koester Environmental Services 14649 Highway 41 North, Griffith, IN 47725, Attn: Erin Blankenberger						
File No.	2205	Date	BS-3	Sample #	8/23/2001	Tested By	AK

Source of Material	
Description of Soil	Brown Silty Clay

Control Sieve No.	=	# 200	
Weight dry sample	=	500	g
Weight of dry sample after washing	=	98.3	g
Percent fines, %	=	**80.3**	

Remarks	

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive Burr Ridge, IL 60521 Ph: 630-321-0944 Fax: 630-321-0945

PERCENT FINES
ASTM D1140

Project	ACS Superfund Site-Field and laboratory testing services						
Client	Koester Environmental Services 14649 Highway 41 North, Griffith, IN 47725, Attn: Erin Blankenberger						
File No.	2205	Date	BS-4	Sample #	8/23/2001	Tested By	AK

Source of Material	
Description of Soil	Brown Silty Clay

Control Sieve No.	=	# 200	
Weight dry sample	=	500	g
Weight of dry sample after washing	=	107.5	g
Percent fines, %	=	**78.5**	

Remarks	

APPENDIX E

SPECIFIC GRAVITY

	Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**SPECIFIC GRAVITY** **ASTM D 854**

Project	ACS Superfund Site								
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham								
File No.	2205	**Date**	7/27/2001	**Sample ID**	BS-1	**Tested by:**	AM	**QC by:**	SB

Sample Location	
Sample Description	Brown Silty Clay

Test No.	1	2		
Vol. Of Flask @ 20^0c	250.0	250.0		
Method of air removal[1]	Vacuum	Vacuum		
Mass fl.+ water+soil=M_{bws}	389.59	384.90		
Temperature, ^{0}c	23.0	23.0		
Mass fl.+water[2] **= M_{bw}**	359.09	354.44		
Dish No.				
Mass dish + dry soil				
Mass of dish				
Mass of dry soil = M_s	50.00	50.00		
$M_w = M_s+M_{bw}-M_{bws}$	19.50	19.54		
$\alpha = \rho_t/\rho 20^0$c	0.99735	0.99735		
$G_s = \alpha M_s/M_w$	2.557	2.552		
Average Specific Gravity =	**2.55**			

Remarks:	M_{bw} is the mass of the flask filled with water at same temp. +/- 1^0c as for M_{bws} or value from
calibration curve at T of M_{bws}	

	Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**SPECIFIC GRAVITY** **ASTM D 854**

Project	ACS Superfund Site								
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham								
File No.	2205	**Date**	8/17/2001	**Sample ID**	2	**Tested by:**	AM	**QC by:**	SB

Sample Location	
Sample Description	Brown Silty Clay

Test No.	1	2		
Vol. Of Flask @ 20^{0}c	250.0	250.0		
Method of air removal[1]	Vacuum	Vacuum		
Mass fl.+ water+soil=M_{bws}	385.17	390.09		
Temperature, ^{0}c	22.0	22.0		
Mass fl.+water[2] = M_{bw}	353.99	359.19		
Dish No.				
Mass dish + dry soil				
Mass of dish				
Mass of dry soil = M_s	50.00	50.00		
$M_w = M_s+M_{bw}-M_{bws}$	18.82	19.10		
$\alpha = \rho_t/\rho 20^0$c	0.99780	0.99780		
$G_s = \alpha\ M_s/M_w$	2.651	2.612		
Average Specific Gravity =	**2.63**			

Remarks:	M_{bw} is the mass of the flask filled with water at same temp. +/- 1^{0}c as for M_{bws} or value from
calibration curve at T of M_{bws}	

	Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**SPECIFIC GRAVITY** **ASTM D 854**

Project	ACS Superfund Site								
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham								
File No.	2205	**Date**	8/17/2001	**Sample ID**	3	**Tested by:**	AM	**QC by:**	SB

Sample Location	
Sample Description	Brown Silty Clay

Test No.	1	2		
Vol. Of Flask @ 20^{0}c	250.0	250.0		
Method of air removal[1]	Vacuum	Vacuum		
Mass fl.+ water+soil=M_{bws}	388.29	392.21		
Temperature, ^{0}c	22.0	22.0		
Mass fl.+water[2] = M_{bw}	357.41	361.08		
Dish No.				
Mass dish + dry soil				
Mass of dish				
Mass of dry soil = M_s	50.00	50.00		
$M_w = M_s+M_{bw}-M_{bws}$	19.12	18.87		
$\alpha = \rho_t/\rho 20^0$c	0.99780	0.99780		
$G_s = \alpha M_s/M_w$	2.609	2.644		
Average Specific Gravity =	**2.63**			

Remarks:	M_{bw} is the mass of the flask filled with water at same temp. +/- 1^{0}c as for M_{bws} or value from
calibration curve at T of M_{bws}	

	Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**SPECIFIC GRAVITY** **ASTM D 854**

Project	ACS Superfund Site								
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham								
File No.	2205	**Date**	8/17/2001	**Sample ID**	4	**Tested by:**	AM	**QC by:**	SB

Sample Location	
Sample Description	Brown Silty Clay

Test No.	1	2		
Vol. Of Flask @ 20^0c	250.0	250.0		
Method of air removal[1]	Vacuum	Vacuum		
Mass fl.+ water+soil=M_{bws}	385.12	390.19		
Temperature, ^{0}c	22.0	22.0		
Mass fl.+water[2] **= M_{bw}**	354.25	359.16		
Dish No.				
Mass dish + dry soil				
Mass of dish				
Mass of dry soil = M_s	50.00	50.00		
$M_w = M_s+M_{bw}-M_{bws}$	19.13	18.97		
$\alpha = \rho_t/\rho 20^0$c	0.99780	0.99780		
$G_s = \alpha M_s/M_w$	2.608	2.630		
Average Specific Gravity =	**2.62**			

Remarks:	M_{bw} is the mass of the flask filled with water at same temp. +/- 1^0c as for M_{bws} or value from
calibration curve at T of M_{bws}	

Great Lakes Soil & Environmental Consultants, Inc
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

COEFFICIENT OF PERMEABILITY - ASTM D5084 (FLEXIBLE WALL)

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File #	2205	**Date Tested**	7/30/2001	**Tested by:**	AK	**QC by:**	SB
Sample ID:	BS-1		**Location**				
Sample Description	Brown silty clay						

Specimen Data

Initial

Diameter:	10.16	cm	Area, A:	81.1	sq cm
Height, L:	5.20	cm	Volume, V:	421.6	cu cm
Mass of Sample:	850.0	g	**Moisture Content:**	**16.5**	**%**
			Wet Density	125.8	**pcf**
			Dry Density	108.0	**pcf**

Final

Diameter:	10.10	cm	Area, A:	80.1	sq cm
Height, L:	5.10	cm	Volume, V:	408.6	cu cm
Mass of Sample:	879.50	g	**Moisture Content:**	**17.4**	**%**
			Wet Density	134.3	**pcf**
			Dry Density	114.4	**pcf**
			Deg of Saturation	95.8	

Test Data

Permeant:	De-aired Tap Water
Cell Pressure	80.0 psi
Top Pressure	75.0 psi
Bottom Pressure	77.0 psi
Gradient:	27.0

Date	Time	Elapsed Time (Sec)	Cumulative Time (Sec)	Burette Readings		Outflow/Inflow Ratio	Fluid Temp. oC	Permeability cm/sec
				Outflow cc	Inflow cc			
7/31/2001	11:00 AM	0	0	2.68	4.80		20.0	---
7/31/2001	12:00 PM	3600	3600	3.08	4.40	1.0	20.0	4.66E-08
7/31/2001	1:10 PM	4200	7800	3.46	4.06	1.1	20.0	3.52E-08
7/31/2001	2:30 PM	4800	12600	3.84	3.70	1.1	20.0	3.38E-08
7/31/2001	3:30 PM	3600	16200	4.12	3.40	0.9	20.0	3.88E-08
						Average Permeability =		**3.9E-08** cm/sec

Remarks:

0

Great Lakes Soil & Environmental Consultants, Inc
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

COEFFICIENT OF PERMEABILITY - ASTM D5084 (FLEXIBLE WALL)

Project	ACS Superfund Site-Field and Laboratory Testing Services					
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham					
File #	2205	**Date Tested**	8/15/2001	**Tested by:**	AK	**QC by:** SB
Sample ID:	BS-2		**Location**			
Sample Description	Browish gray silty clay					

Specimen Data

Initial

Diameter:	10.16	cm	Area, A:	81.1	sq cm
Height, L:	4.80	cm	Volume, V:	389.2	cu cm
Mass of Sample:	778.0	g	**Moisture Content:**	**18.5**	**%**
			Wet Density	**124.8**	**pcf**
			Dry Density	**105.3**	**pcf**

Final

Diameter:	10.05	cm	Area, A:	79.3	sq cm
Height, L:	4.75	cm	Volume, V:	376.8	cu cm
Mass of Sample:	791.00	g	**Moisture Content:**	**20.0**	**%**
			Wet Density	**131.0**	**pcf**
			Dry Density	**109.1**	**pcf**
			Deg of Saturation	**96.2**	

Test Data

Permeant:	De-aired Tap Water	
Cell Pressure	80.0	psi
Top Pressure	75.0	psi
Bottom Pressure	77.0	psi
Gradient:	29.3	

Date	Time	Elapsed Time (Sec)	Cumulative Time (Sec)	Burette Readings		Outflow/Inflow Ratio	Fluid Temp. oC	Permeability cm/sec
				Outflow cc	Inflow cc			
8/15/2001	10:20 AM	0	0	1.85	5.48		20.0	---
8/15/2001	11:15 AM	3300	3300	2.03	5.25	0.8	20.0	2.51E-08
	12:20 PM	3900	7200	2.25	5.02	1.0	20.0	2.16E-08
	1:25 PM	3900	11100	2.44	4.84	1.1	20.0	1.72E-08
	3:15 PM	6600	17700	2.80	4.41	0.8		2.49E-08
						Average Permeability =	**2.2E-08**	**cm/sec**

Remarks:

Great Lakes Soil & Environmental Consultants, Inc
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

COEFFICIENT OF PERMEABILITY - ASTM D5084 (FLEXIBLE WALL)

Project	ACS Superfund Site-Field and Laboratory Testing Services					
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham					
File #	2205	**Date Tested**	8/15/2001	**Tested by:**	AK	**QC by:** SB
Sample ID:	BS-3		**Location**			
Sample Description	Brownis gray silty clay					

Specimen Data

Initial

Diameter:	10.16	cm	Area, A:	81.1	sq cm
Height, L:	5.20	cm	Volume, V:	421.6	cu cm
Mass of Sample:	825.0	g	**Moisture Content:**	**17.0**	**%**
			Wet Density	**122.1**	**pcf**
			Dry Density	**104.4**	**pcf**

Final

Diameter:	10.00	cm	Area, A:	78.5	sq cm
Height, L:	5.02	cm	Volume, V:	394.3	cu cm
Mass of Sample:	838.00	g	**Moisture Content:**	**18.6**	**%**
			Wet Density	**132.6**	**pcf**
			Dry Density	**111.8**	**pcf**
			Deg of Saturation	**95.8**	

Test Data

Permeant:	De-aired Tap Water
Cell Pressure	80.0 psi
Top Pressure	75.0 psi
Bottom Pressure	77.0 psi
Gradient:	27.0

Date	Time	Elapsed Time (Sec)	Cumulative Time (Sec)	Burette Readings		Outflow/Inflow Ratio	Fluid Temp. oC	Permeability cm/sec
				Outflow cc	Inflow cc			
8/15/2001	10:15 AM	0	0	2.12	5.23		20.0	---
	11:15 AM	3600	3600	2.36	5.01	1.1	20.0	2.44E-08
	12:20 PM	3900	7500	2.54	4.77	0.8	20.0	2.50E-08
	1:25 PM	3900	11400	2.81	4.53	1.1	20.0	2.55E-08
	3:15 PM	6600	18000	3.09	4.18	0.8	20.0	2.26E-08
						Average Permeability =		**2.4E-08** cm/sec

Remarks:

Great Lakes Soil & Environmental Consultants, Inc
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

COEFFICIENT OF PERMEABILITY - ASTM D5084 (FLEXIBLE WALL)

Project	ACS Superfund Site-Field and Laboratory Testing Services						
Client	Koester Environmental Services 14649 Highway 41 North, Evansville, IN 47725 Attn.: Mr. Jeff Wickham						
File #	2205	**Date Tested**	8/15/2001	**Tested by:**	AK	**QC by:**	SB
Sample ID:	BS-4		**Location**				
Sample Description	Brownish gray silty clay						

Specimen Data

Initial

Diameter:	10.16	cm	Area, A:	81.1	sq cm
Height, L:	5.60	cm	Volume, V:	454.0	cu cm
Mass of Sample:	905.0	g	**Moisture Content:**	**17.0**	**%**
			Wet Density	**124.4**	**pcf**
			Dry Density	**106.3**	**pcf**

Final

Diameter:	10.00	cm	Area, A:	78.5	sq cm
Height, L:	5.40	cm	Volume, V:	424.1	cu cm
Mass of Sample:	912.00	g	**Moisture Content:**	**18.1**	**%**
			Wet Density	**134.2**	**pcf**
			Dry Density	**113.6**	**pcf**
			Deg of Saturation	**97.6**	

Test Data

Permeant:	De-aired Tap Water	
Cell Pressure	80.0	psi
Top Pressure	75.0	psi
Bottom Pressure	77.0	psi
Gradient:	25.1	

Date	Time	Elapsed Time (Sec)	Cumulative Time (Sec)	Burette Readings		Outflow/Inflow Ratio	Fluid Temp. oC	Permeability cm/sec
				Outflow cc	Inflow cc			
8/15/2001	10:20 AM	0	0	2.56	4.98		20.0	---
8/15/2001	11:15 AM	3300	3300	2.75	4.82	1.2		2.14E-08
8/15/2001	12:20 PM	3900	7200	2.89	4.65	0.8		1.95E-08
8/15/2001	1:25 PM	3900	11100	3.06	4.44	0.8		2.45E-08
8/15/2001	3:15 PM	6600	17700	3.35	4.15	1.0		2.05E-08

Average Permeability = **2.1E-08** cm/sec

Remarks:

APPENDIX F

Geotechnical Field and Laboratory Testing Results of Existing Material in the Off-Site Area (Great Lakes)

Report
Geotechnical Field and Laboratory Testing Services
ACS Superfund Site,Griffith, IN

Prepared for:

Montgomery Watson Constructors, Inc.
27755 Diehl Road
Warrenville, IL 60555

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive
Burr Ridge, IL 60521

Great Lakes
Soil & Environmental
Consultants, Inc.

333 Shore Drive
Burr Ridge, IL 60521
Ph: (630) 321-0944
Fax: (630) 321-0945
www.greatlakessoil.com

Engineering, soil and material testing

File No. 2147
July 11, 2001

Mr. Tom Tinics
Montgomery Watson Constructors, Inc.
27755 Diehl Road, Suite 300
Warrenville, IL 60555

Report
Laboratory and Field Testing Services
ACS Superfund Site, Griffith, Indiana

Dear Mr. Tinics:

Great Lakes Soil & Environmental Consultants, Inc.(GLSEC) is pleased to submit this report providing the field and laboratory test results for the above-referenced project.

Locations and results of field compaction testing are included in Appendix A. Appendix B contains locations, and laboratory test results for the four soil samples collected. The laboratory tests consisted of Standard Proctor (ASTM D698), Atterberg Limits (ASTM D4318), Grain-size analysis (ASTM D422) and Specific Gravity (ASTM D854). A summary of the laboratory tests is also provided in Appendix B. Thickness of clay cap measured at several places. A portable posthole auger was used to auger through the clay cap. Locations and clay cap thickness are included in Appendix C.

GLSEC highly appreciates the opportunity to be of service to Montgomery Watson Constructors, Inc. If you have any questions about this report, please feel free to call us at 630-321-0944.

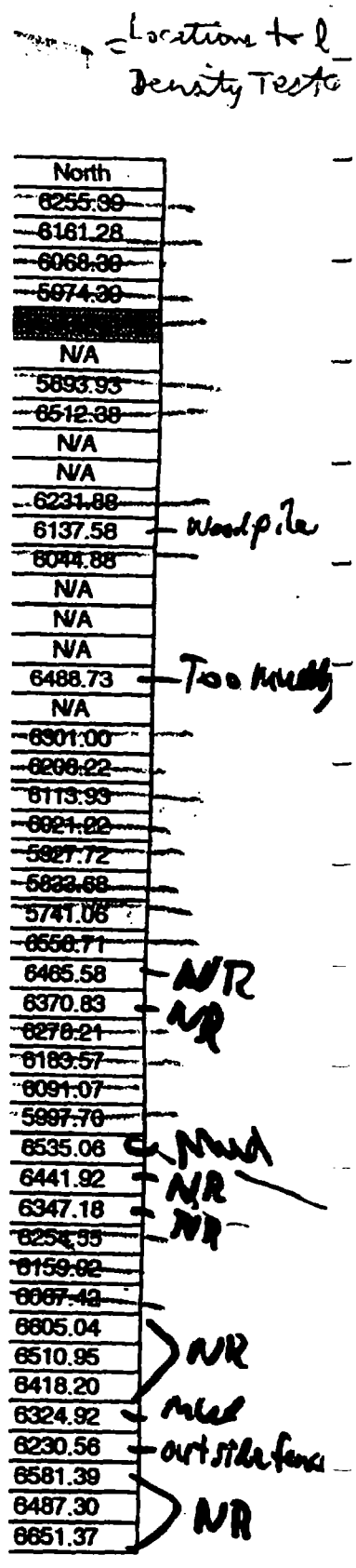
Thank you.

Very truly yours,
Great Lakes Soil & Environmental Consultants, Inc.

Sanjeev Bandi, Ph.D., P.E.
Principal Engineer

Doppalapudi S. Rao, P.E.
Principal Engineer

APPENDIX A


Locations + l
Density Tests
North
6255.39
6161.28
6068.39
5974.39
N/A
5893.93
6512.38
N/A
N/A
6231.88
6137.58
6044.88
N/A
N/A
N/A
6488.73
N/A
6301.00
6206.22
6113.93
6021.22
5927.72
5833.68
5741.06
6556.71
6465.58
6370.83
6276.21
6183.57
6091.07
5997.70
6535.06
6441.92
6347.18
6254.55
6159.92
6067.43
6605.04
6510.95
6418.20
6324.92
6230.56
6581.39
6487.30
6651.37
Woodpile
Too muddy
NR
NR
Mud
NR
NR
NR
mud
outside fence
NR
ation on top

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:									
File No.	2147	Date	6-26-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		ROLLER		Gauge Serial No.	75-6436			Specification, % M	18

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 16	[illegible]	CLAY	12		112.8	10.3	109	103.5	
1		STA 96	6"-12"/1	CLAY	12		113.1	12.5	109	103.8	
1		STA 95	6"-12"/1	CLAY	12		108.9	11.0	109	99.9	
1		STA 15		CLAY	12		110.2	11.6	109	101.1	
1		STA 44		CLAY	12		109.6	11.3	109	100.6	
1		STA 54		CLAY	12		108.5	10.9	109	99.5	
1		STA 45		CLAY	12		120.7	9.9	109	110.7	
1		STA 64		CLAY	12		108.0	10.9	109	99.1	
1		STA 63		CLAY	12		112.7	11.4	109	103.4	
1		STA 62		CLAY	12		122.0	9.8	109	111.9	
1		STA 58		CLAY	12		113.9	10.1	109	104.5	
1		STA 66		CLAY	12		110.0	9.7	109	100.9	
1		STA 57		CLAY	12		114.5	11.0	109	105.0	

Remarks:					
Field Technician Signature	[signature]	QC by:	SB	Date:	7/6/01

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	MONTGOMERY WATSON								
File No.	2147	Date	6-18-01	Report No.		Page No.	1	Specification, % PR	95
Equipment Used for Compaction		ROLLER		Gauge Serial No.	75-6436			Specification, % M	

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 48	8'/1	BROWN CLAY	6		117.9	12.4	109	108.2	P
1		STA 49			12		118.0	12.4		108.3	P
1		STA 50			12		109.2	9.1		100.2	P
1		STA 51			12		127.5	9.4		117.0	P
1		STA 52			12		122.5	9.7		112.4	P
1		STA 53			12		110.7	12.7		101.6	P
1		STA 55			12		111.8	10.9		102.6	P
1		STA 56			12		116.4	8.2		106.8	P
1		STA 74			12		112.3	7.7		103.0	P
1		STA 77			12		116.1	7.1		106.5	P
1		STA 67			12		112.6	10.5		103.3	P
1		STA 59			6		125.2	9.6		114.9	P
1		STA 68			6		123.6	9.3		113.4	P
1		STA 69			12		125.4	8.8		115.0	P
1		STA 70			12		117.7	7.1		102.0	P
1		STA 71			6		117.3	10.5		107.6	P
1		STA 72			6		120.5	9.4		110.6	P
1		STA 73			12		108.4	9.4		99.4	P
1		STA 80			6		124.8	10.7		114.5	P
1		STA 86			12		114.1	7.8		104.7	P

Remarks:				
Field Technician Signature		QC by:	SB	Date: 7/6/01

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL								
Client:	MONTGOMERY WATSON								
File No.	2147	Date	6-18-01	Report No.		Page No.	2	Specification, % PR	95
Equipment Used for Compaction		ROLLER		Gauge Serial No.	75-6436			Specification, % M	

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 79	8''/1	BROWN CLAY	12		122.5	9.9	109	112.4	P
1		STA 85	↓	↓	12		118.5	9.4	↓	108.7	P
1		STA 78	↓	↓	6		123.5	8.4	↓	113.3	P
1		STA 84	↓	↓	12		112.6	5.7	↓	103.3	P
1		STA 61	↓	↓	6		124.9	10.0	↓	114.6	P

Remarks:

Field Technician Signature: [signature] QC by: SB Date: 7/6/01

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL
Client:	MONTGOMERY WATSON CONSTRACTORS
File No.	2147
Date:	6-15-01
Type of Equipment Used for Compaction:	ROLLERS
Specification:	95

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 17	B"/1	BROWN CLAY	12		120.8	9.2	109	110.8	P
1		STA 8		"	12		121.8	10.5		111.7	P
1		STA 27		"	12		114.9	17.4		105.4	P
1		STA 35		"	6		126.8	70.8		116.3	P
1		STA 26		"	6		124.6	10.1		114.3	P
1		STA 34		"	12		123.9	10.3		113.7	P
1		STA 6		"	12		118.5	9.0		108.7	P
1		STA 5		"	12		122.8	11.5		112.7	P
1		STA 4		"	12		120.7	12.6		110.7	P
1		STA 3		"	12		120.3	10.3		110.4	P
1		STA 2		"	12		118.0	9.6		108.3	P
1		STA 1		"	12		115.2	8.9		105.7	P
1		STA 25		"	12		120.1	14.4		110.2	P
1		STA 7		"	12		120.2	11.9		110.3	P
1		STA 10		"	12		121.1	9.6		111.1	P
1		STA 11		"	6		125.6	10.4		115.2	P
1		STA 12		"	6		121.5	9.0		111.5	P
1		STA 13		"	6		122.9	8.9		112.8	P
1		STA 14		"	6		122.0	13.0		111.9	P

Tested By:

Remarks:

Great Lakes Soil & Environmental Consultants, Inc.

333 Shore Drive, Burr Ridge, IL 60521 Ph.: (630) 321-0944 Fax: (630) 321-0945

Field Density Test Report (Nuclear Density Test)

Project:	AMERICAN CHEMICAL
Client:	MONTGOMERY WATSON CONTRACTORS
File No.	2147
Date:	6-15-01
Type of Equipment Used for Compaction:	ROLLER
Specification:	95

Test Number	Retest Ref. No.	Location of Test	Elevation/ Lift No.	Soil Description	Probe Depth (Inches)	Wet Density (pcf)	Dry Density (pcf)	Moisture (%)	Proctor (pcf)	% Compaction	Pass Fail
1		STA 24	BC 1 1	BROWN CLAY	12		119.3	11.9	109	109.4	P
1		STA 23		"	6		118.1	9.6		108.3	P
1		STA 22		"	6		125.4	9.8		115.0	P
1		STA 21		"	12		122.1	11.7		112.0	P
1		STA 20		"	6		119.5	9.8		109.6	P
1		STA 19		"	12		114.5	10.6		105.0	P
1		STA 28		"	12		113.8	11.5		104.4	P
1		STA 29		"	6		126.4	8.7		116.0	P
1		STA 30		"	12		116.0	10.1		106.4	P
1		STA 31		"	6		121.1	9.9		111.1	P
1		STA 32		"	6		121.8	9.9		111.7	P
1		STA 33		"	12		116.4	14.2		106.8	P
1		STA 43		"	6		122.9	10.0		112.8	P
1		STA 42		"	6		122.9	10.3		112.8	P
1		STA 41		"	6		121.7	10.2		111.7	P
1		STA 40		"	12		122.1	10.0		112.0	P
1		STA 39		"	12		112.8	12.7		103.5	P
1		STA 38		"	12		122.6	9.6		112.5	P
1		STA 37		"	6		122.9	9.5		112.8	P
1		STA 47		"	12		112.8	9.9		103.5	P

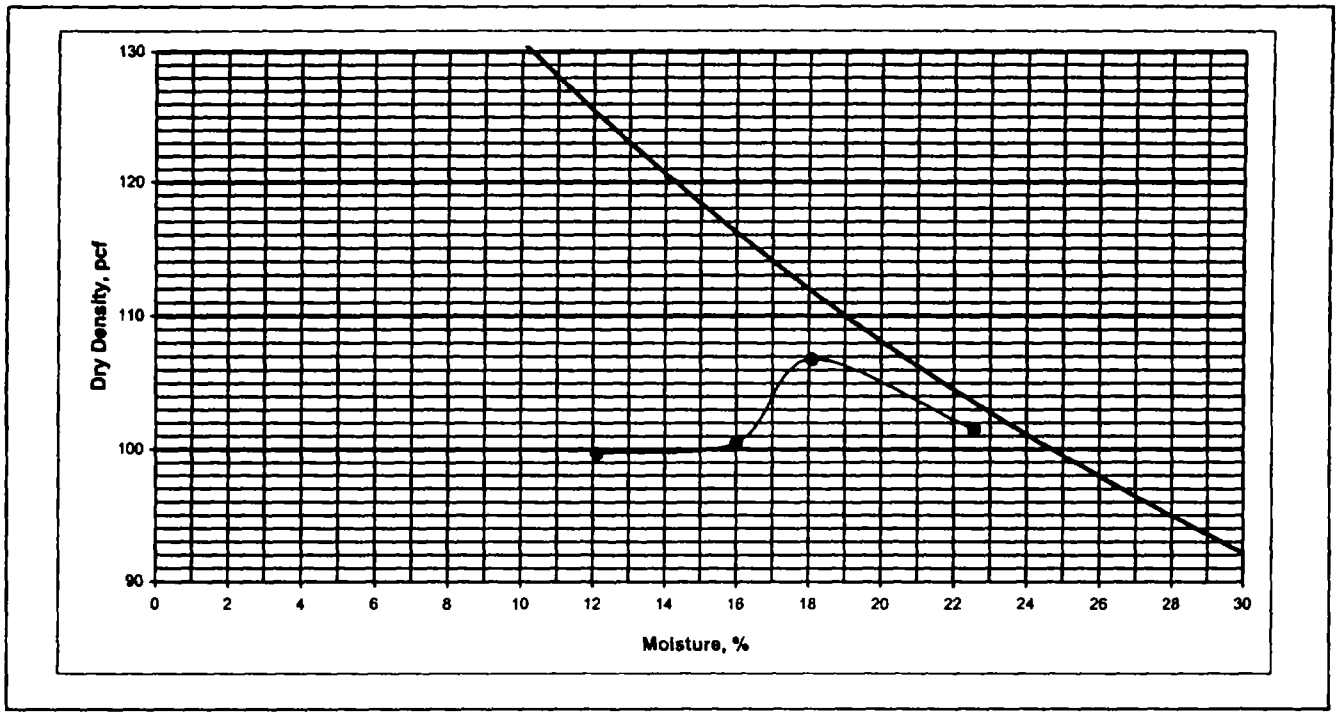
Tested By: [signature]

Remarks:

Great Lakes Soil & Environmental Consultants Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	MOISTURE - DENSITY RELATIONSHIP CURVE ASTM D698-91

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555 Attn.: Mr. Tom Tinics						
File No.	2147	**Sample #**	1	**Date Tested**	6/14/2001	**Tested By**	AM
						Qc By	SB

Sample Location									
Sample Description	Brownish Gray Silty Clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**			25				



Zero Air Void Curve Specific Gravity: 2.65

Results

Maximum Dry Density, pcf	107.0	**Optimum Moisture Content, %**	18.0	**Natural Moisture Content, %**	

Remarks

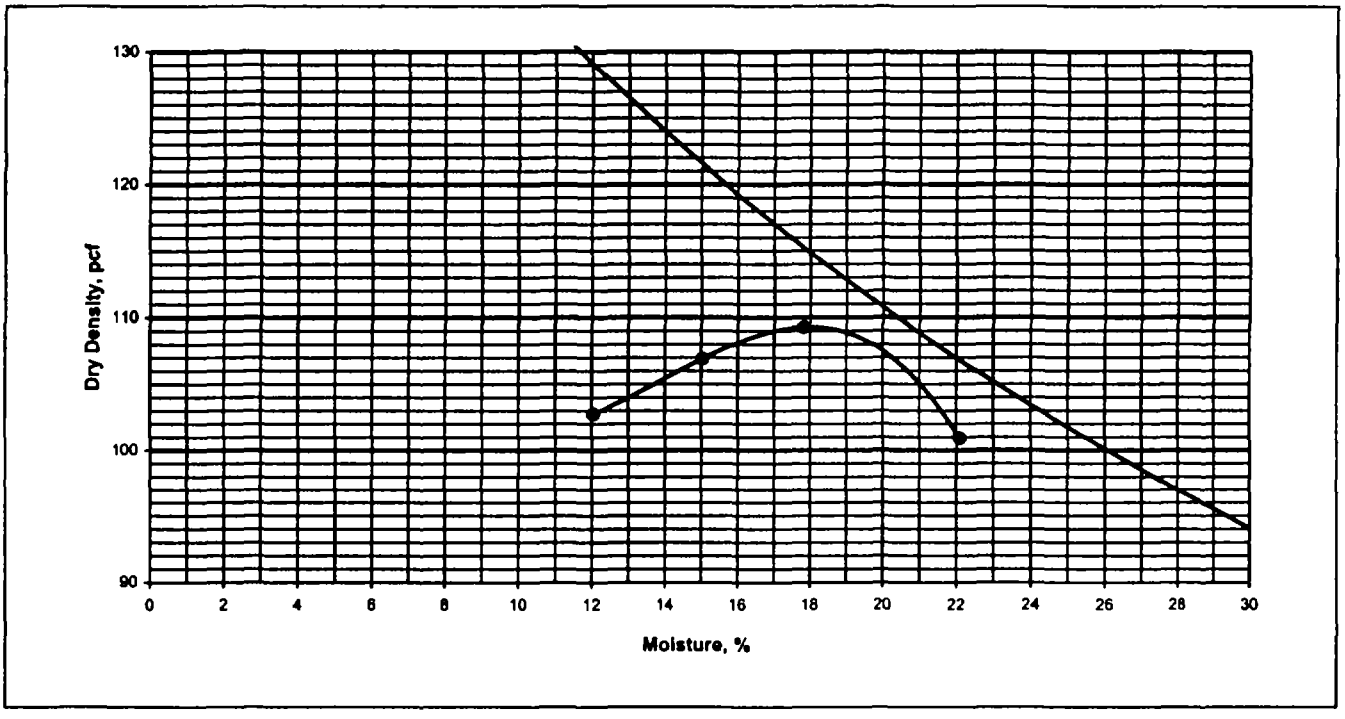
Great Lakes Soil & Environmental Consultants Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

MOISTURE - DENSITY RELATIONSHIP CURVE

ASTM D698-91

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555 Attn.: Mr. Tom Tinics						
File No.	2147	**Sample #**	BS-2	**Date Tested**	6/20/2001	**Tested By**	AM
						Qc By	SB

Sample Location									
Sample Description	Gray Silty Clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**		25					



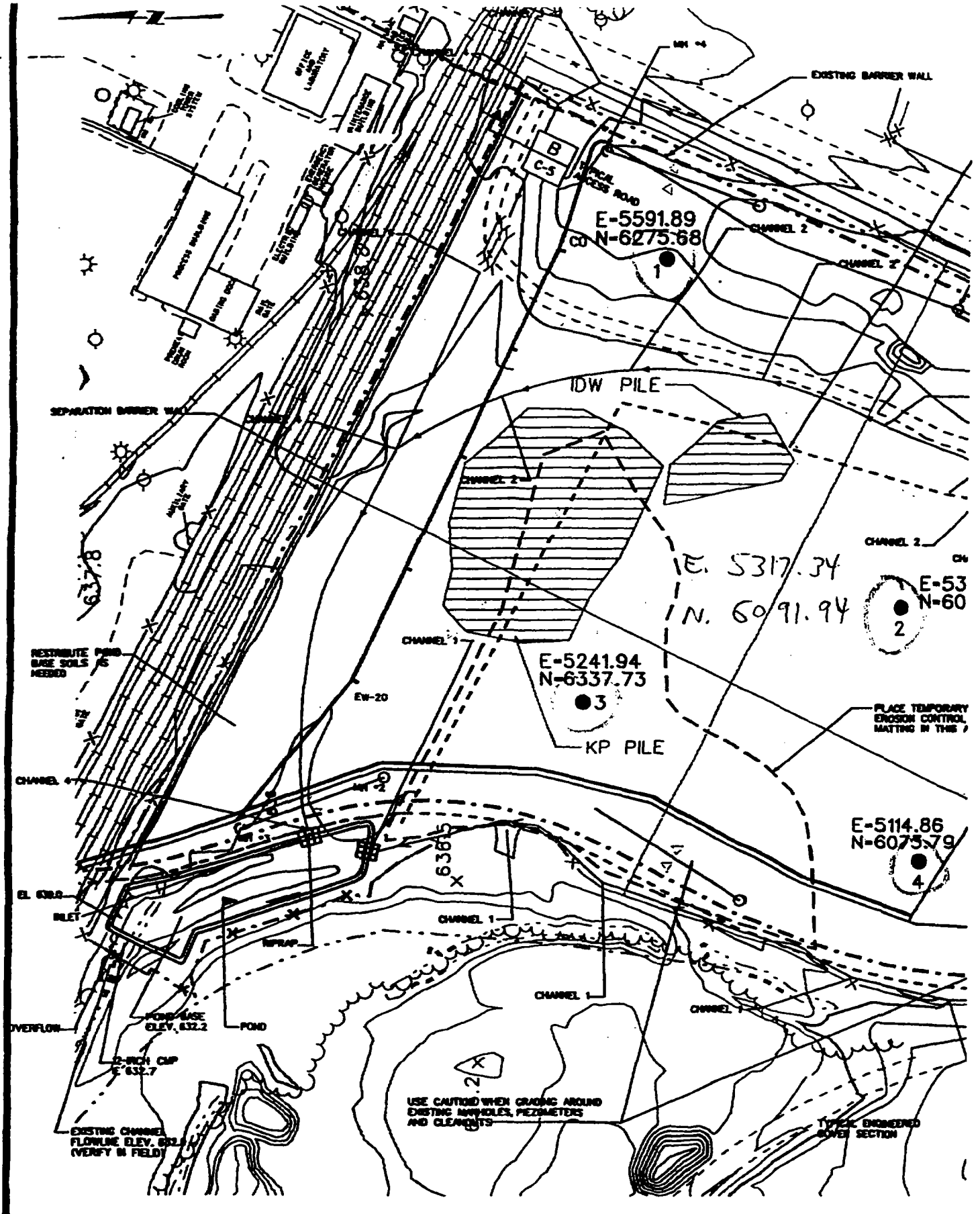
Zero Air Void Curve Specific Gravity: 2.75

Results

Maximum Dry Density, pcf	109.0	**Optimum Moisture Content, %**	18.0	**Natural Moisture Content, %**	

Remarks

APPENDIX B



SCALE
1" = 50'-0"

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS

DESIGNED TAB
DRAWN RBA

SUBMITTED BY
PROJECT MANAGER
LICENSE NO.
DATE

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

SUMMARY OF LABORATORY TEST DATA

Project	ACS Superfund Site					
Client	Montgomery Watson Constructors, Inc., 2775 Diehl Road, Suite 300, Warrenville, IL 60555, Attn: Mr. Tom Tinics					
File No.	2147	**Date**	7/11/2001		**QC by:**	SB

Soil Collection Point	1	2	3	4
Standard Proctor Density (pcf)	110	115	118	115
Optimum Moisture Content (%)	16	15	14.5	16.5
Liquid Limit	29	27	28	27
Plastic Limit	15	15	14	13
Plasticity Index	14	12	14	14
Classification	CL	CL	CL	CL
% Passing #200	76.6	75.5	78.1	75.1
Specific Gravity	2.53	2.69	2.64	2.6

Great Lakes Soil & Environmental Consultants Inc.

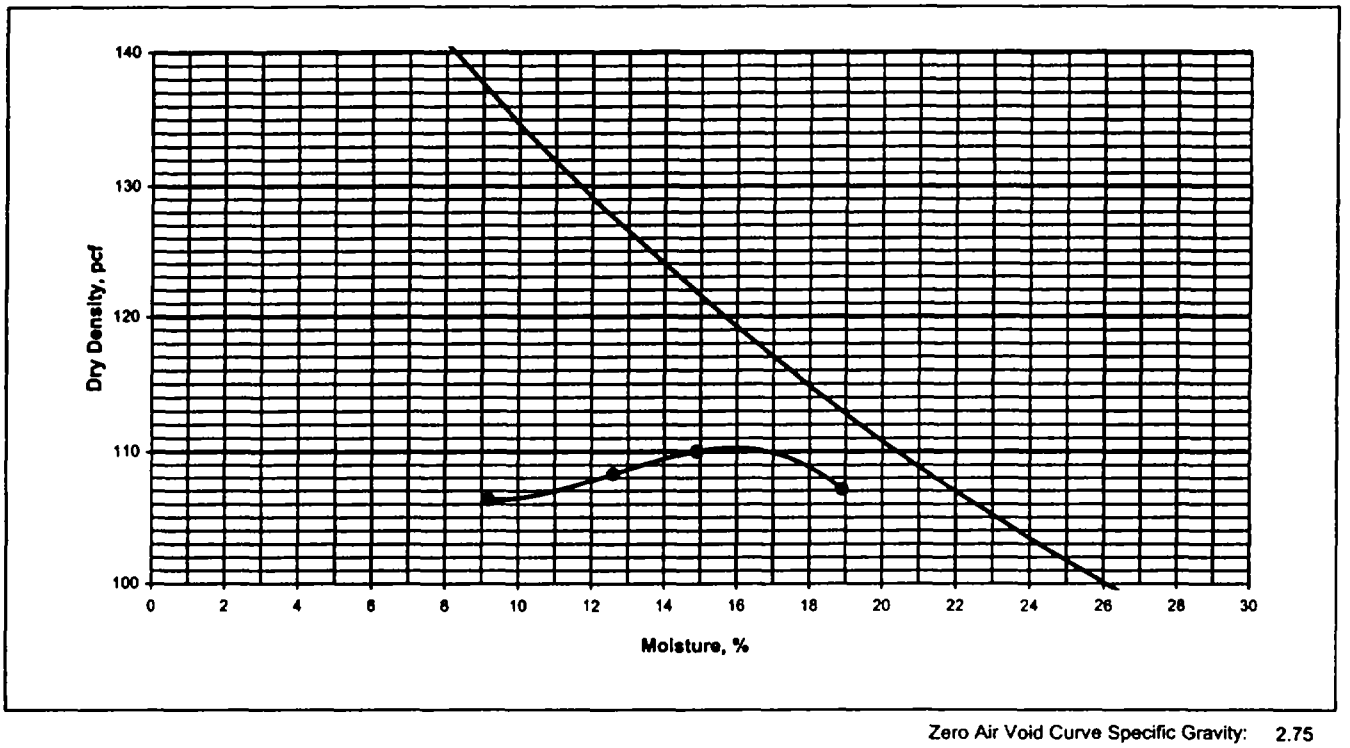
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

MOISTURE - DENSITY RELATIONSHIP CURVE

ASTM D698-91

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555						
File No.	2147	**Sample #**	#1	**Date Tested**	6/26/2001	**Tested By**	AM
						Qc By	SB

Sample Location	*Soil collection at point-1; E5591.89, N 6275.68*								
Sample Description	Brown silty clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, In.**	12
No. of Layers	3	**No. of Blows per Layer**			25				



Zero Air Void Curve Specific Gravity: 2.75

Results

Maximum Dry Density, pcf	110.0	**Optimum Moisture Content, %**	16.0	**Natural Moisture Content, %**	

Remarks

Great Lakes Soil & Environmental Consultants Inc.

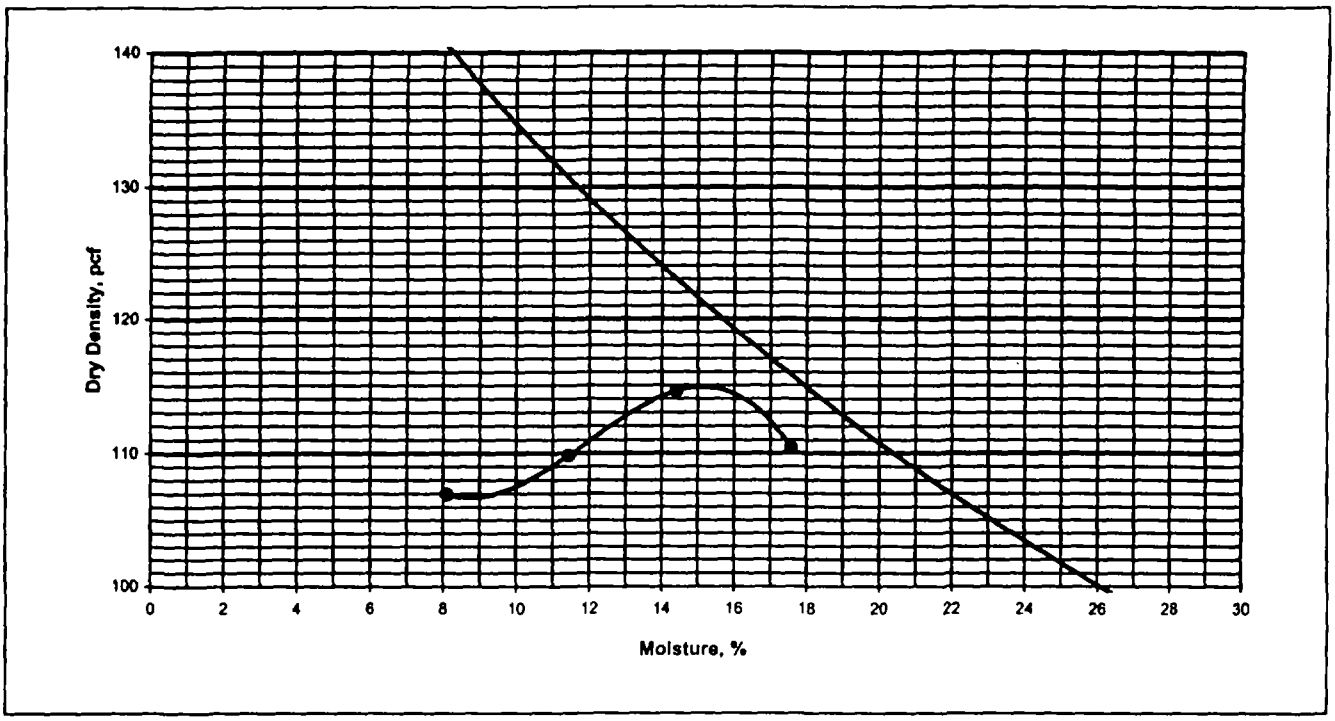
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

MOISTURE - DENSITY RELATIONSHIP CURVE

ASTM D698-91

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555						
File No.	2147	**Sample #**	#2	**Date Tested**	6/26/2001	**Tested By**	AM
						Qc By	SB

Sample Location	Soil collection at point-2; E5300, N6000								
Sample Description	Brown silty clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**		25					



Zero Air Void Curve Specific Gravity: 2.75

Results

Maximum Dry Density, pcf	115.0	**Optimum Moisture Content, %**	15.0	**Natural Moisture Content, %**	

Remarks

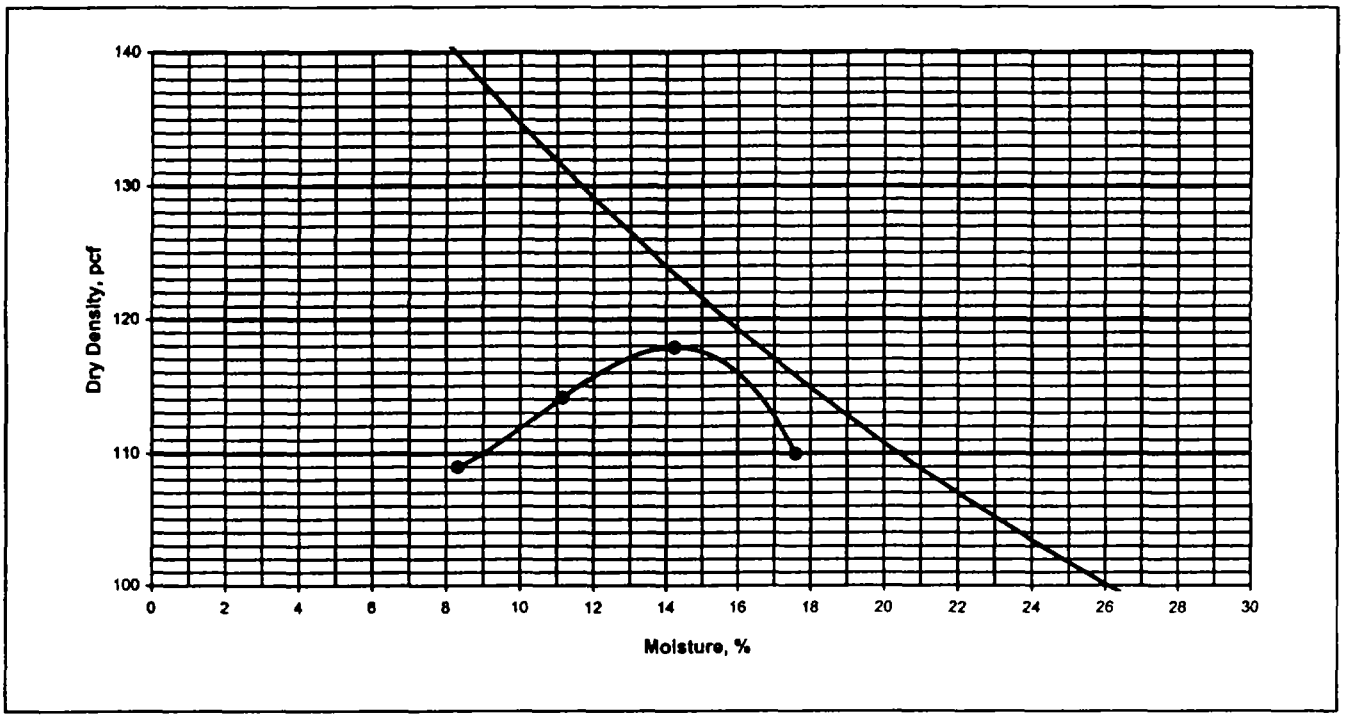
Great Lakes Soil & Environmental Consultants Inc.
333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

MOISTURE - DENSITY RELATIONSHIP CURVE

ASTM D698-91

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555						
File No.	2147	**Sample #**	#3	**Date Tested**	6/26/2001	**Tested By**	AM
						Qc By	SB

Sample Location	Soil collection at point-3; E5241.94, N6337.73								
Sample Description	Brown silty clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**			25				



Zero Air Void Curve Specific Gravity: 2.75

Results

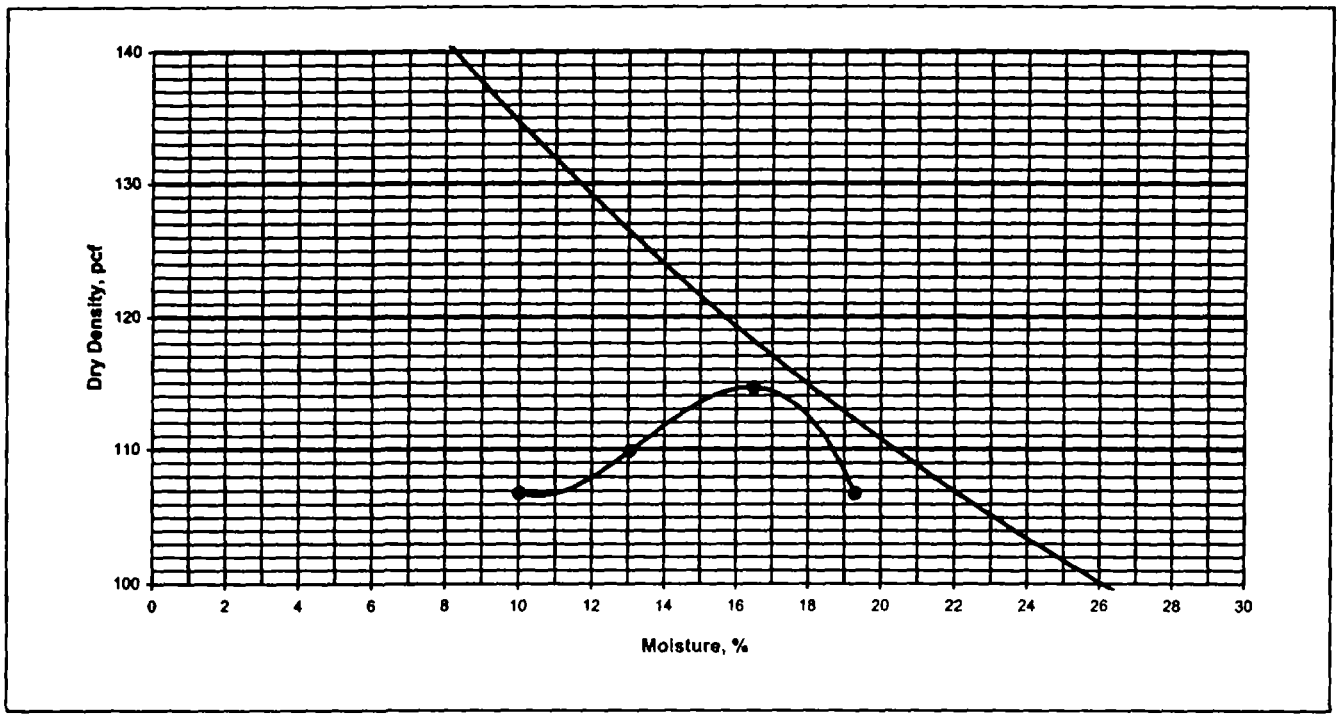
Maximum Dry Density, pcf	**118.0**	**Optimum Moisture Content, %**	**14.5**	**Natural Moisture Content, %**	

Remarks

	Great Lakes Soil & Environmental Consultants Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**MOISTURE - DENSITY RELATIONSHIP CURVE** **ASTM D698-91**

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555						
File No.	2147	**Sample #**	#4	**Date Tested**	6/26/2001	**Tested By**	AM
						Qc By	SB

Sample Location	Soil collection at point-4; N6073.79, E5114.86								
Sample Description	Brown silty clay								
Type of Proctor	Standard	**Method:**	A	**Mold Size, in.**	4	**Hammer Weight, lb.**	5.5	**Drop, in.**	12
No. of Layers	3	**No. of Blows per Layer**		25					



Zero Air Void Curve Specific Gravity: 2.75

Results

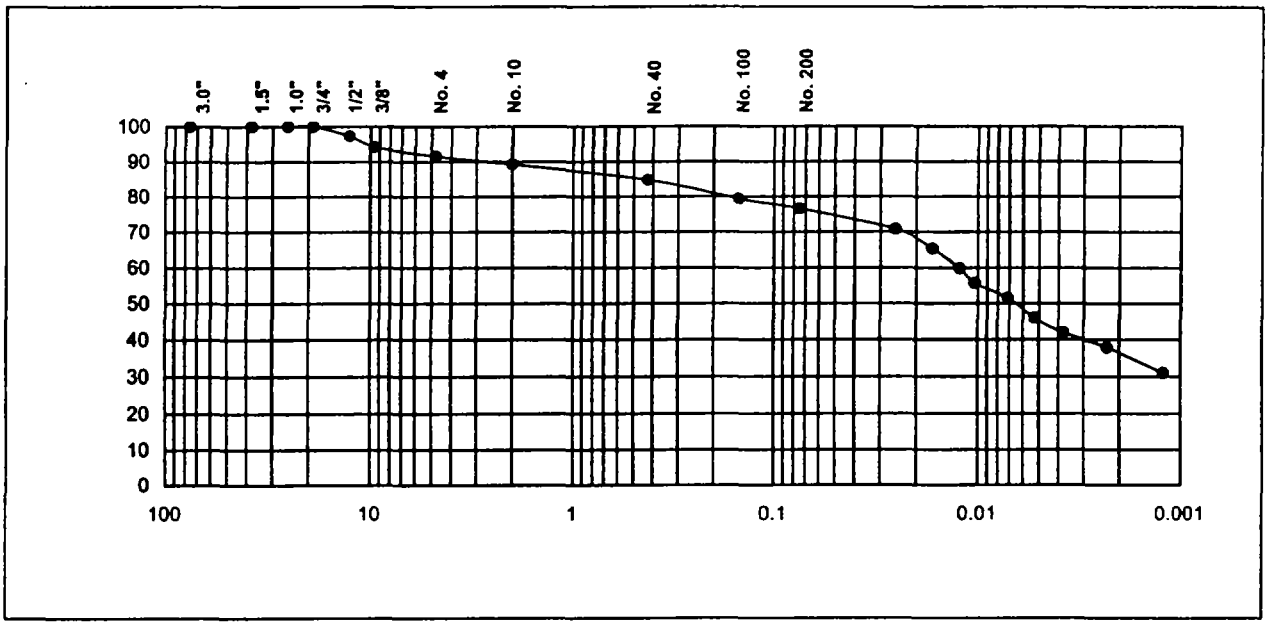
Maximum Dry Density, pcf	115.0	**Optimum Moisture Content, %**	16.5	**Natural Moisture Content, %**	

Remarks

Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	GRAIN SIZE ANALYSIS (ASTM D422)

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555 Attn.: Mr. Tom Tinics						
File No.	2147		#1	**Date Tested**	7/2/2001	**Tested by**	AK
						Qc by	SB

Sample Location	Soil collection at point-1; E5591.89, N 6275.68
Sample Description	Brown silty clay



% + 3"	% Gravel	% Sand	% Silt	% Clay
0.0	8.5	14.9	31.2	45.4

Sieve Size	Percent Passing
3.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	97.3
3/8"	94.2
No. 4	91.5
No. 10	89.3
No. 40	84.7
No. 100	79.3
No. 200	76.6

Liquid Limit, L_L	Plastic Limit, PL	Plasticity Index, PI
29	15	14

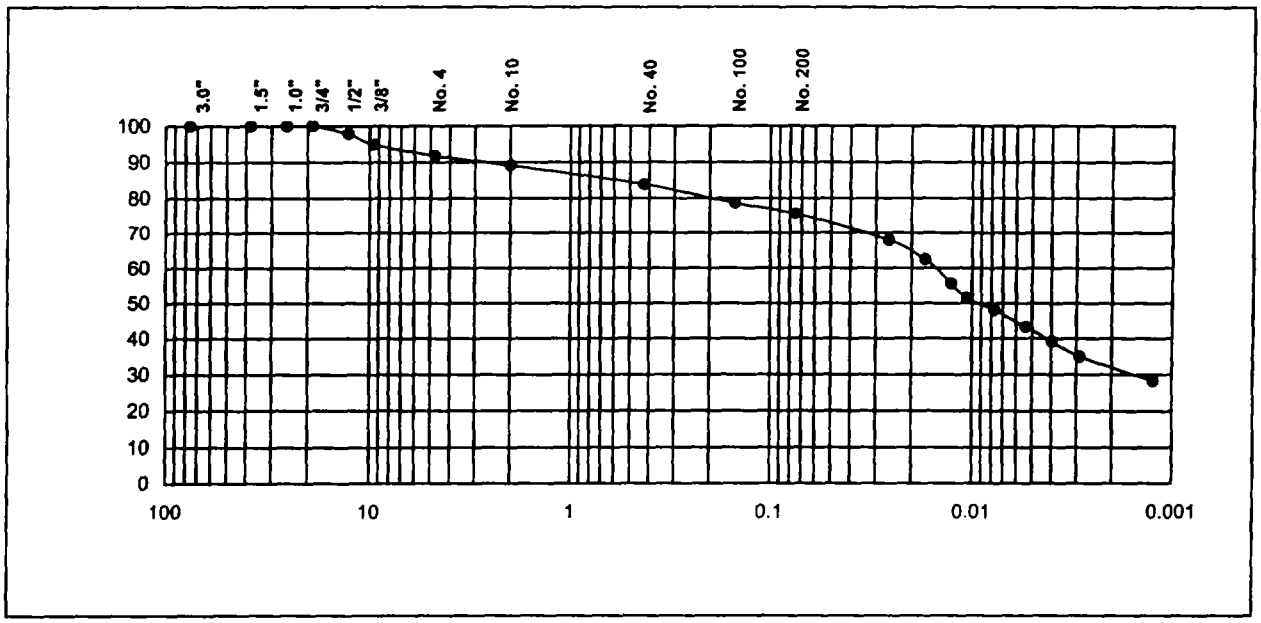
Soil Classification:	CL
Soil Description:	Lean Clay with Sand
System:	USCS

Remarks:

Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	GRAIN SIZE ANALYSIS (ASTM D422)

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555 Attn.: Mr. Tom Tinics						
File No.	2147		#2	**Date Tested**	7/2/2001	**Tested by**	AK
						Qc by	SB

Sample Location	Soil collection at point-2; E5300, N6000
Sample Description	Brown silty clay



% + 3"	% Gravel	% Sand	% Silt	% Clay
0.0	8.2	16.3	33.5	42.0

Sieve Size	Percent Passing
3.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	97.8
3/8"	94.9
No. 4	91.8
No. 10	89.1
No. 40	83.9
No. 100	78.5
No. 200	75.5

Liquid Limit, L_L	Plastic Limit, PL	Plasticity Index, PI
27	15	12

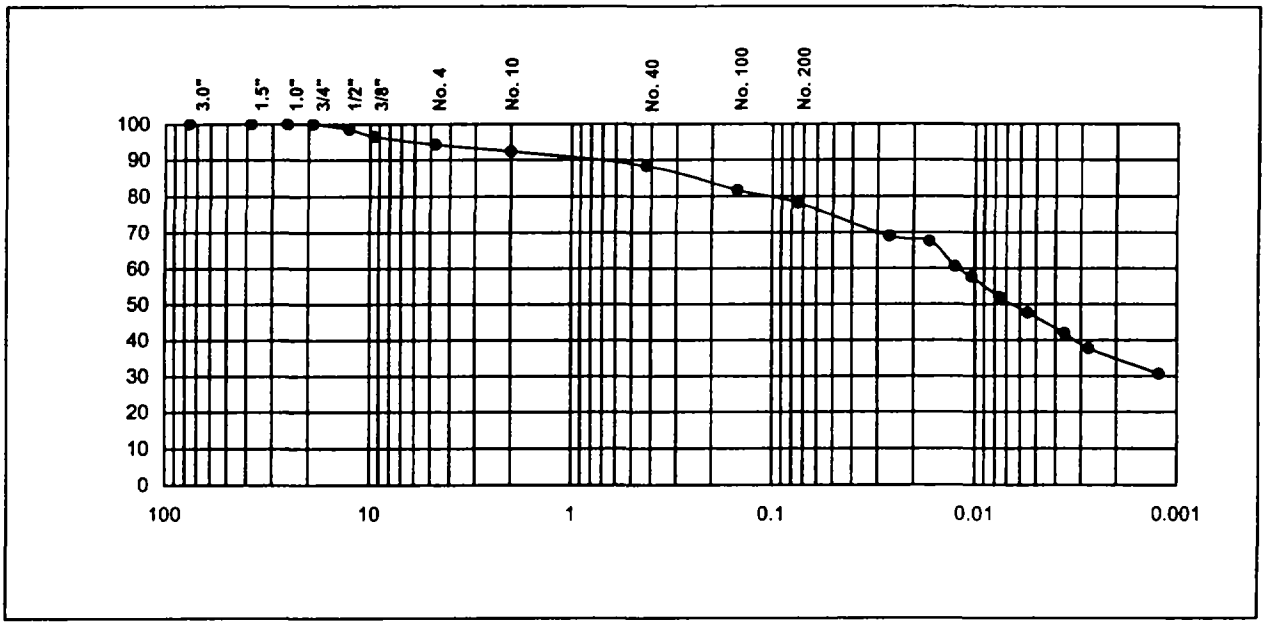
Soil Classification:	CL
Soil Description:	Lean Clay with Sand
System:	USCS

Remarks:

Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	GRAIN SIZE ANALYSIS (ASTM D422)

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555 Attn.: Mr. Tom Tinics						
File No.	2147		#3	**Date Tested**	7/2/2001	**Tested by**	AK
						Qc by	SB

Sample Location	Soil collection at point-3; E5241.94, N6337.73
Sample Description	Brown silty clay



% + 3"	% Gravel	% Sand	% Silt	% Clay
0.0	5.8	16.1	32.3	45.8

Sieve Size	Percent Passing
3.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	98.5
3/8"	96.5
No. 4	94.2
No. 10	92.3
No. 40	88.3
No. 100	81.7
No. 200	78.2

Liquid Limit, L_L	Plastic Limit, PL	Plasticity Index, PI
28	14	14

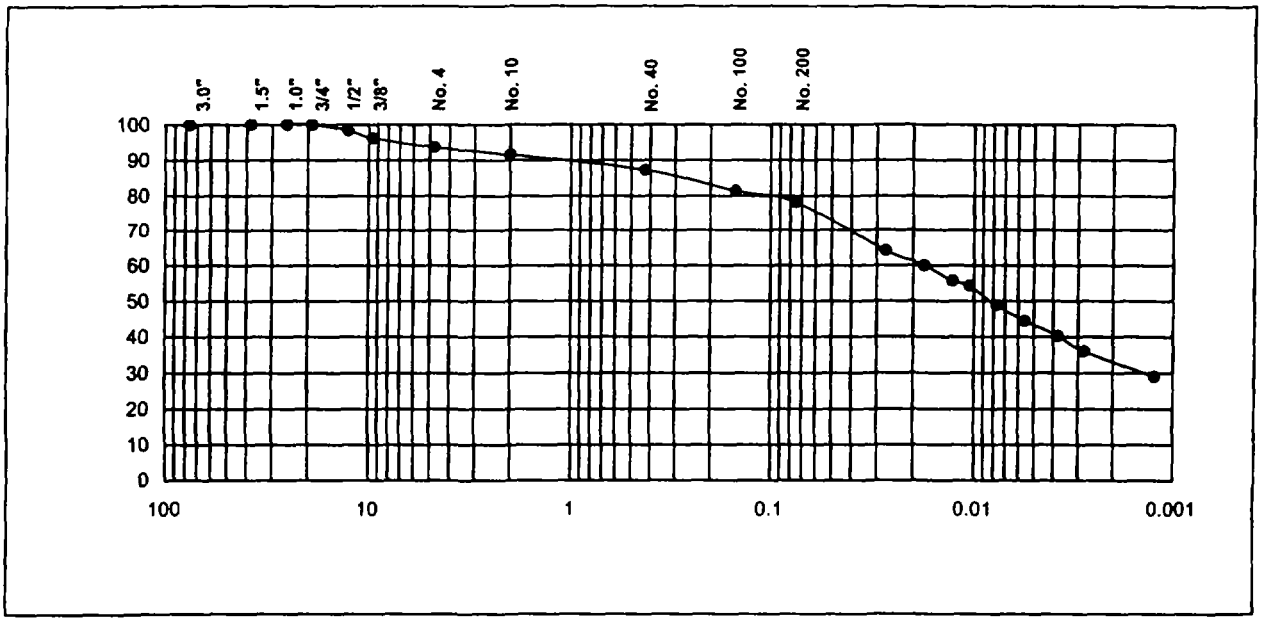
Soil Classification:	CL
Soil Description:	Lean Clay with Sand
System:	USCS

Remarks:

Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive, Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	GRAIN SIZE ANALYSIS (ASTM D422)

Project	ACS Superfund Site, Griffith, IN						
Client	Montgomery Watson Constructors, Inc. 2775 Diehl Road, Suite 300, Warrenville, IL 60555 Attn.: Mr. Tom Tinics						
File No.	2147		#4	**Date Tested**	7/2/2001	**Tested by**	AK
						Qc by	SB

Sample Location	Soil collection at point-4; N6073.79, E5114.86
Sample Description	Brown silty clay



% + 3"	% Gravel	% Sand	% Silt	% Clay
0.0	6.3	15.5	35.1	43.0

Sieve Size	Percent Passing
3.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	98.4
3/8"	96.2
No. 4	93.7
No. 10	91.6
No. 40	87.2
No. 100	81.4
No. 200	78.1

Liquid Limit, L_L	Plastic Limit, PL	Plasticity Index, PI
27	13	14

Soil Classification:	CL
Soil Description:	Lean Clay with Sand
System:	USCS

Remarks:

	Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**SPECIFIC GRAVITY** **ASTM D 854**

Project	ACS Superfund Site								
Client	Montgomery Watson Constructors, Inc., 2775 Diehl Road, Suite 300, Warrenville, IL 60555, Attn: Mr. Tom Tinics								
File No.	2147	**Date**	7/2/2001	**Sample ID**	#1	**Tested by:**	AM	**QC by:**	SB

Sample Location	
Sample Description	Brown Silty Clay

Test No.	1	2		
Vol. Of Flask @ 20°c	250.0	250.0		
Method of air removal[1]	Vacuum	Vacuum		
Mass fl.+ water+soil=M_{bws}	391.28	384.54		
Temperature, °c	26.0	26.0		
Mass fl.+water[2] = M_{bw}	360.91	354.32		
Dish No.				
Mass dish + dry soil				
Mass of dish				
Mass of dry soil = M_s	50.00	50.00		
$M_w = M_s+M_{bw}-M_{bws}$	19.63	19.78		
$\alpha = \rho_v/\rho 20^0c$	0.99681	0.99681		
$G_s = \alpha M_s/M_w$	2.539	2.520		
Average Specific Gravity =	**2.529**			

Remarks:	M_{bw} is the mass of the flask filled with water at same temp. +/- 1°c as for M_{bws} or value from
calibration curve at T of M_{bws}	

	Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**SPECIFIC GRAVITY** **ASTM D 854**

Project	ACS Superfund Site								
Client	Montgomery Watson Constructors, Inc., 2775 Diehl Road, Suite 300, Warrenville, IL 60555, Attn: Mr. Tom Tinics								
File No.	2147	**Date**	7/2/2001	**Sample ID**	#2	**Tested by:**	AM	**QC by:**	SB

Sample Location	
Sample Description	Brown Silty Clay

Test No.	1	2		
Vol. Of Flask @ 20°c	250.0	250.0		
Method of air removal[1]	Vacuum	Vacuum		
Mass fl.+ water+soil=M_{bws}	390.08	388.25		
Temperature, °c	26.0	26.0		
Mass fl.+water[2] = M_{bw}	358.68	356.77		
Dish No.				
Mass dish + dry soil				
Mass of dish				
Mass of dry soil = M_s	50.00	50.00		
$M_w = M_s+M_{bw}-M_{bws}$	18.60	18.52		
$\alpha = \rho_t/\rho 20°c$	0.99681	0.99681		
$G_s = \alpha M_s/M_w$	2.680	2.691		
Average Specific Gravity =	**2.685**			

Remarks:	M_{bw} is the mass of the flask filled with water at same temp. +/- 1°c as for M_{bws} or value from
calibration curve at T of M_{bws}	

Great Lakes Soil & Environmental Consultants, Inc.
333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945

SPECIFIC GRAVITY
ASTM D 854

Project	ACS Superfund Site								
Client	Montgomery Watson Constructors, Inc., 2775 Diehl Road, Suite 300, Warrenville, IL 60555, Attn: Mr. Tom Tinics								
File No.	2147	**Date**	7/2/2001	**Sample ID**	#3	**Tested by:**	AM	**QC by:**	SB

Sample Location	
Sample Description	Brown Silty Clay

Test No.	1	2		
Vol. Of Flask @ 20°c	250.0	250.0		
Method of air removal[1]	Vacuum	Vacuum		
Mass fl.+ water+soil=M_{bws}	385.41	392.01		
Temperature, °c	26.0	26.0		
Mass fl.+water[2] = M_{bw}	353.95	361.21		
Dish No.				
Mass dish + dry soil				
Mass of dish				
Mass of dry soil = M_s	50.00	50.00		
$M_w = M_s+M_{bw}-M_{bws}$	18.54	19.20		
$\alpha = \rho_t/\rho 20°c$	0.99681	0.99681		
$G_s = \alpha M_s/M_w$	2.688	2.596		
Average Specific Gravity =	**2.642**			

Remarks:	M_{bw} is the mass of the flask filled with water at same temp. +/- 1°c as for M_{bws} or value from
calibration curve at T of M_{bws}	

	Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**SPECIFIC GRAVITY** **ASTM D 854**

Project	ACS Superfund Site								
Client	Montgomery Watson Constructors, Inc., 2775 Diehl Road, Suite 300, Warrenville, IL 60555, Attn: Mr. Tom Tinics								
File No.	2147	**Date**	7/2/2001	**Sample ID**	#4	**Tested by:**	AM	**QC by:**	SB

Sample Location	
Sample Description	Brown Silty Clay

Test No.	1	2		
Vol. Of Flask @ 20^{0}c	250.0	250.0		
Method of air removal[1]	Vacuum	Vacuum		
Mass fl.+ water+soil=M_{bws}	389.92	385.07		
Temperature, ^{0}c	26.0	26.0		
Mass fl.+water[2] = M_{bw}	359.12	354.21		
Dish No.				
Mass dish + dry soil				
Mass of dish				
Mass of dry soil = M_s	50.00	50.00		
$M_w = M_s+M_{bw}-M_{bws}$	19.20	19.14		
$\alpha = \rho_t/\rho 20^0$c	0.99681	0.99681		
$G_s = \alpha M_s/M_w$	2.596	2.604		
Average Specific Gravity =	**2.600**			

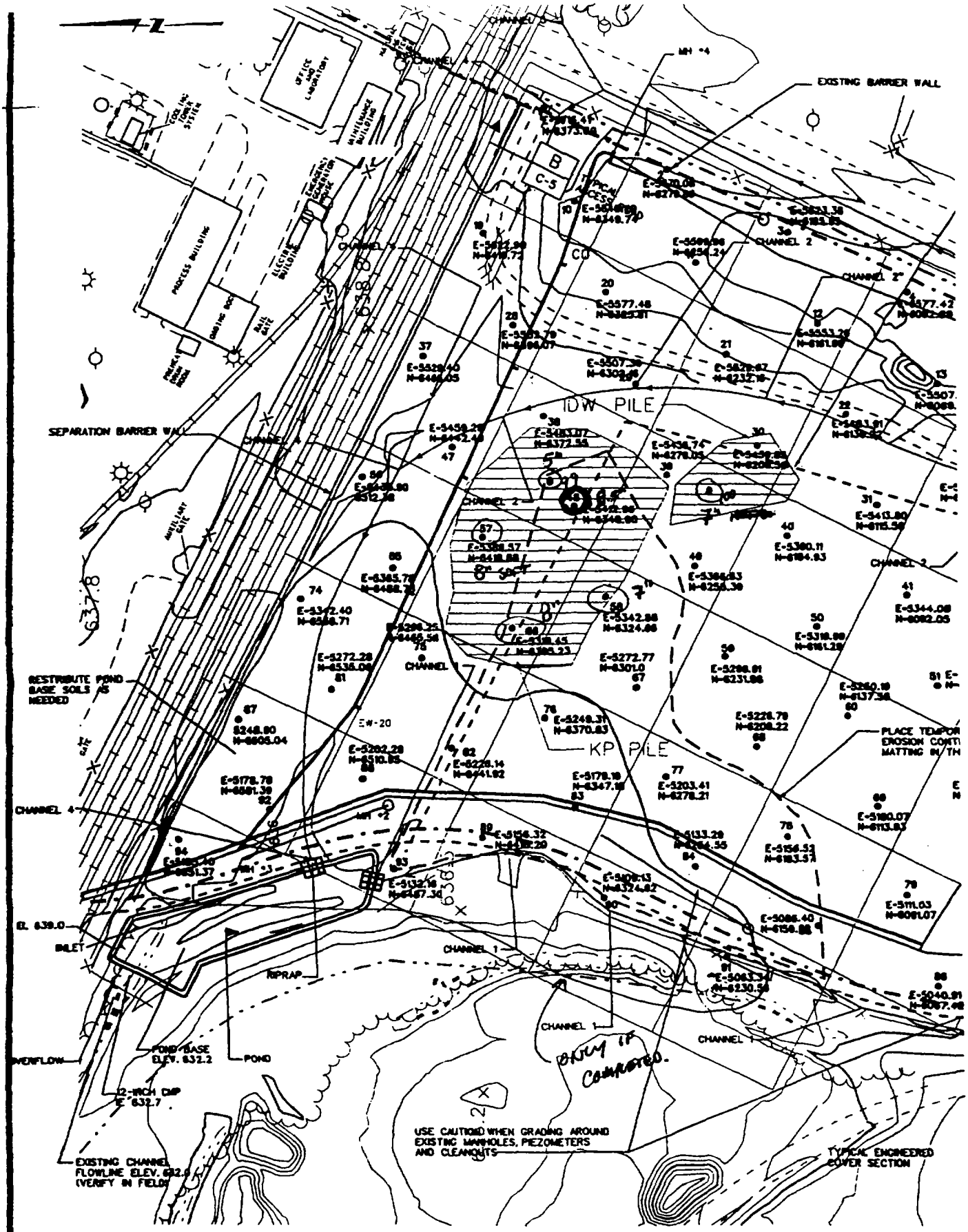
Remarks:	M_{bw} is the mass of the flask filled with water at same temp. +/- 1^{0}c as for M_{bws} or value from
calibration curve at T of M_{bws}	

APPENDIX C

	Great Lakes Soil & Environmental Consultants, Inc. 333 Shore Drive Burr Ridge, IL 60521 Ph: (630) 321-0944 Fax: (630) 321-0945	**CLAY THICKNESS**

Project	ACS Superfund Site							
Client	Montgomery Watson Constructors, Inc., 2775 Diehl Road, Suite 300, Warrenville, IL 60555, Attn: Mr. Tom Tinics							
File No.	2147	**Date**	6/26/2001		**Tested by:**	AL	**QC by:**	SB

Station No.	Thickness (inches)
15	10
16	7
44	14
45	8
48	8.5
53	6
54	8
57	8
58	7
62	6
63	8
64	4
66	8
95	4.5
96	6
97	8
98	6.5
99	5
100	7



Chris May (630) 836-8968

Job No: MW Job # File: J:\209\0801 ecs\0107 tem off site cover\drawings\ecs28c08_F.dgn Plot Date: 11-JUN-2001 12:48

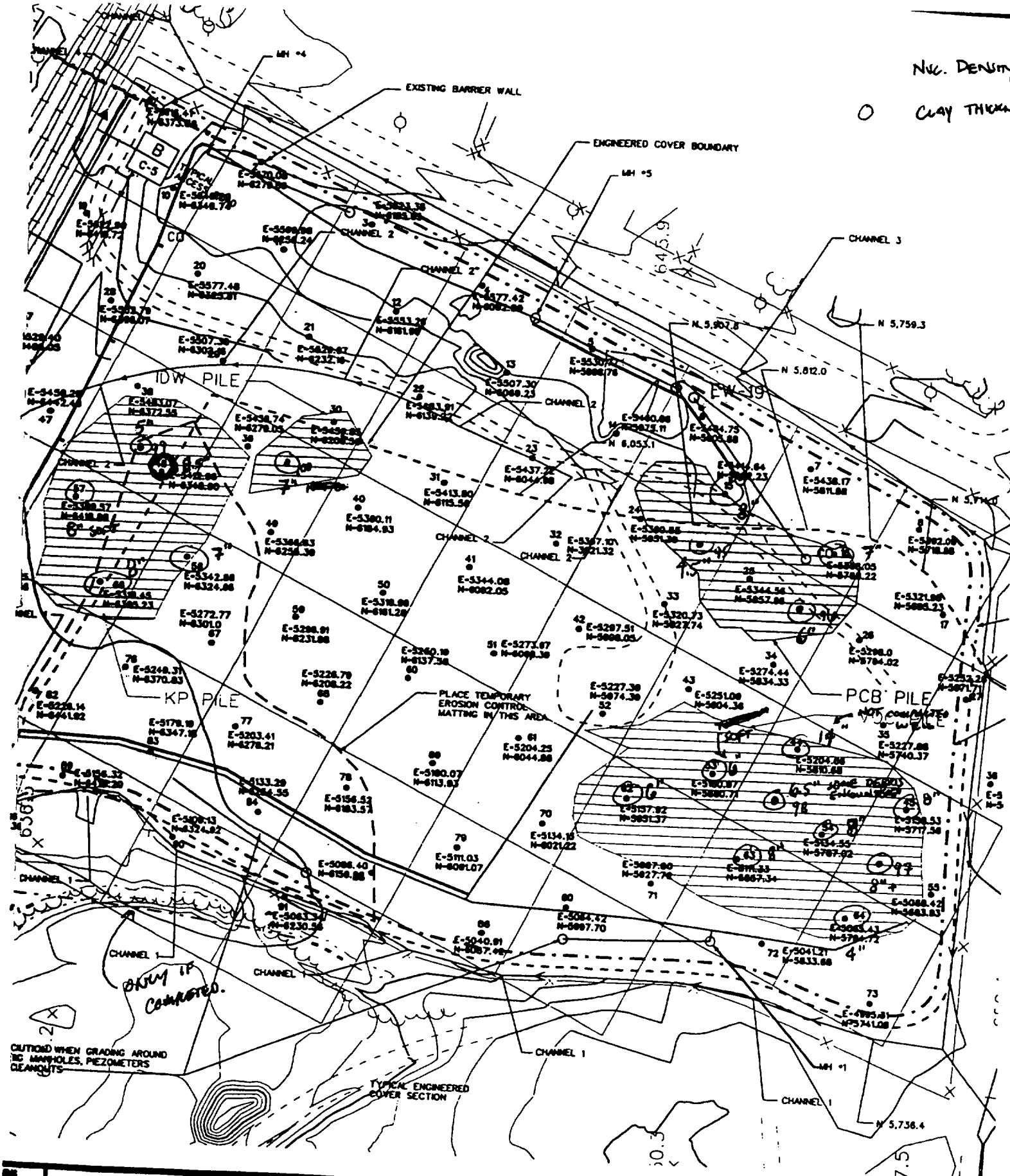
REV	DATE	BY	DESCRIPTION

SCALE: 1" = 80'-0"

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED TAB
DRAWN RBA
CHECKED

SUBMITTED BY
PROJECT MANAGER/ LICENSE NO. DATE
(COMPANY OFFICER) LICENSE NO. DATE



DESIGNED TAB	SUBMITTED BY			
DRAWN RBA	PROJECT MANAGER	LICENSE NO.	DATE	MONTGOMERY WATSON Chicago, Illinois
CHECKED	(COMPANY OFFICER)	LICENSE NO.	DATE	ACS RD/RA GI AMERICAN CHEMICAL SERVICE GRIFFITH, INDI

APPENDIX G

Construction Details for Piezometers Installed in the Off-Site Area

Table A – Off-Site Area Piezometer Construction Details

Table A
Off-Site Area Piezometer Construction Details
ACS NPL Site
Griffith, Indiana

Barrier Wall Piezometer Pairs	Date Installed	Inside/ Outside Barrier Wall	Diameter (in.)	Screen Length (ft.)	Height above ground (ft.)	Total Lenth of Well Material (ft.)	Planned Well Depth (ft.)	Actual Well Depth (ft.)	Depth of Clay (ft.)	Elevation of Top of Inner Casing[2] (ft.)
P109	9/18/01	Outside	2	5	3.33	22.87	20	19.27	21	644.30
P110	9/17/01	Inside	2	5	5.17	27.13	22	21.69	NE	647.68
P111	9/18/01	Outside	2	5	2.92	27.94	25	24.75	26[1]	650.03
P112	9/18/01	Inside	2	5	5.00	32.39	27	27.12	27[1]	653.36
P113	9/18/01	Inside	2	5	5.00	34.37	30	29.10	NE	657.53
P114	9/18/01	Inside	2	5	7.75	35.27	27	27.25	NE	653.69
P115	9/18/01	Outside	2	5	4.58	29.30	25	24.45	26[1]	652.50
P116	9/17/01	Inside	2	5	4.92	24.47	21	19.28	NE	646.26
P117	9/17/01	Outside	2	5	4.58	22.84	18	17.99	20	643.93
P118	9/17/01	Inside	2	5	5.00	24.40	20	19.13	21[1]	645.52

Notes:

1. Indicates soils encountered were silts or clays, but not typical of the clay confining layer.
   May indicate a transition zone into the clay.
2. Surveyed by Area Survey, October 18, 2001

NE Not encountered

P109 and P111 are in protective covers, and were cut down to approximately 3 feet above ground level.

P112 and P117 were cut down to approximately 5 feet above ground.

All depths/heights relative to ground surface of interim engineered cover.

Boring Logs

MWH
MONTGOMERY WATSON HARZA

SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P109
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Dave
Driller's Helper: Alan
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
ATV Rig

Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐ E
Local Grid Location: NA ft ☐ S NA ft ☐ W

NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W

Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/18/01 16:00
End Date: 16:30

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 20'				
1	S	2/4	3/6	60%		20'-22'		0		
						20'-21' Gray/olive silty SAND (SM) saturated, medium dense.				
						21'-21.5' Gray silty CLAY (CL), very hard, low plasticity				
						21.5'-22' Dark gray meduim SAND (SW)				
						End of boring 22'				
						Well set at 20', since some clay was encountered at 21'.				
						Screen length = 5', set at 15'-20'				

MWH
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SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P110
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Jim
Driller's Helper: Jay
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
Track Rig
Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐ E
Local Grid Location: NA ft ☐ S NA ft ☐ W
NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W
Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/17/01 16:00
End Date: 16:25

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 20'				
1	S	2/2	2/10	75%		20'-22' Gray silty SAND (SM) loose, saturated,		2.9		
						1 cm thich clayey SILT seam at 21.5"				
						End of Boring 22'				
						Well set at 22'				
						Screen length = 5', set at 17'-22'				

MWH
MONTGOMERY WATSON HARZA

SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P111
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Dave
Driller's Helper: Alan
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
ATV Rig

Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
Local Grid Location: NA ft ☐ N ☐ S NA ft ☐ E ☐ W

NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W

Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/18/01 14:15
End Date: 14:40

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 26'				
1	W	2/2	2/4	75%		26'-28' Light olive gray clayey SILT (ML) does not roll longer than 2"; trace gravel; soft at 26' to med stiff at 28', low to medium plasticity		2.3		
						End of Boring 28'				
						Well set at 25'				
						Screen length = 5', set at 20'-25'				

MWH
MONTGOMERY WATSON HARZA

SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P112
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Jim
Driller's Helper: Jay
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
Track Rig
Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐ E
Local Grid Location: NA ft ☐ S NA ft ☐ W
NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W
Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/18/01 10:00
End Date: 10:30

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 26'				
1	W/S	2/2	2/2	75%		26'-28'		88		
						26'-26.7' Dark olive gray silty SAND (SM) trace gravel, loose, saturated				
						26.7'-28' Clayey SILT (ML) olive gray, medium stiff, high plasticity, 1" thich coarse sand seam at 27.8'				
						End of Boring 28'				
						Well set at 27'				
						Screen length = 5', set at 22'-27'				

MWH
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SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P113
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Jim
Driller's Helper: Jay
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
Track rig

Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐E
Local Grid Location: NA ft ☐ S NA ft ☐W

NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W

Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/18/01 12:15
End Date: 12:45

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 28'				
1	S	3/4	4/8	75%		28'-30' Light olive gray silty SAND (SM), trace gravel, trace clay, saturated		1.8		
						1 cm thick clayey silt seam, medium dense at 29'				
						End of Boring 30'				
						Well set at 30'				
						Screen length = 5', set at 25'-30'				

MWH
MONTGOMERY WATSON HARZA

SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P114
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Dave
Driller's Helper: Alan
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
ATV Rig

Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐E
Local Grid Location: NA ft ☐ S NA ft ☐W

NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W

Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/18/01 7:45
End Date: 08:25

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 25'				
1	W	6/4	8/6	50%		25'-27' Olive gray silty SAND (SM), grading to sand (SP), little silt at 27' fine-medium grained, loose, wet to saturated, very thin 2-5mm thick silt-clay layer at 26', no gravel.		90		
						End of Boring 27'				
						Well set at 27'				
						Screen length = 5', set at 22'-27'				

MWH
MONTGOMERY WATSON HARZA

SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P115
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Jim
Driller's Helper: Jay
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
Track Rig

Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐ E
Local Grid Location: NA ft ☐ S NA ft ☐ W

NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W

Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/18/01 7:50
End Date: 08:15

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 25'				
1	W	7/6	5/10	50%		25'-27'		15		
						25'-26' Olive gray silty SAND (SM), wet, soft/loose trace to little clay				
						26'-26.2' Gray silty CLAY (CL)				
						26.2'-26.4' SAND				
						26.4'-27' Clayey SILT (ML) dark olive gray, soft, medium to high plasticity				
						End of Boring 27'				
						Well set at 25'				
						Screen length = 5', set at 20'-25'				

MWH
MONTGOMERY WATSON HARZA

SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P116
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Dave
Driller's Helper: Alan
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
ATV Rig

Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐ E
Local Grid Location: NA ft ☐ S NA ft ☐ W

NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W

Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/17/01 14:10
End Date: 14:25

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 19'				
1	W	1/1	1/1	10%		19'-21' Low recovery - gray SAND (SP), little silt		0		
						Approximately 1" of gray CLAY (CL) at bottom of spoon, medium stiff				
						End of Boring 21'				
						Well set at 21'				
						Screen length = 5', set at 16'-21'				

MWH
MONTGOMERY WATSON HARZA

SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P117
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Jim
Driller's Helper: Roy
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
Track Rig

Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐ E
Local Grid Location: NA ft ☐ S NA ft ☐ W

NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W

Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/17/01 14:10
End Date: 14:30

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 19'				
1	M-W	5/6	9/11	100%		19'-21'		5		
						19'-20' Gray to dark gray silty SAND (SP/SM) wet, medium dense				
						20'-21' Dark brown/gray silty CLAY (CL), dry, stiff, low plasticity				
						End of Boring 21'				
						Well set at 18'				
						Screen length = 5', set at 13'-18'				

MWH
MONTGOMERY WATSON HARZA

SOIL BORING LOG

Facility/Project Name: American Chemical Service NPL Site
Location: Griffith IN

Boring No. P118
Project No.

Drilling Company: Boart-Longyear
Driller's Name: Dave
Driller's Helper: Ryan
Drill Method: Hollow Stem Auger (4.25"-ID Auger)
ATV Rig

Water Level: NA
Sample Hammer Torque: NA

State Plane: NA N, NA E
☐ N ☐ E
Local Grid Location: NA ft ☐ S NA ft ☐ W

NA 1/4 of NA 1/4 of Section NA, T NA N,R NA E/W

Surface Elevation: NA
Borehole Diameter at Screen: 8"

Logger: C. Smith
Editor:
Start Date: 9/17/01 15:45
End Date: 16:05

Sample	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Depth (ft)	VISUAL CLASSIFICATION	Penetrometer (Tons/sq. ft.)	PID (ppm)	% Gravel-Sand-Fines	Remarks
						Blind drill to 19'				
1	S	1/2	2/3	75%		19'-21' Dark gray silty SAND (SM), wet, loose		3.9		
						Silt lens at 19'; dark gray/black layers at 20'				
						End of Boring 21'				
						Well set at 20'				
						Screen length = 5', set at 15'-20'				

Air Monitoring Logs

MWH
MONTGOMERY WATSON HARZA

DAILY AIR MONITORING LOG
ACS NPL SITE
Griffith, Indiana

Date: 9/17/01	Page 1 of 1
Site Activity: Installation of Off-Site Area Piezometers	
Monitoring Performed by: C. Smith	

Time	Monitoring Location*	Instrument	Reading (ppm)	Comments
1415	Base of Hole	PID	0.0	Crew begins work in Level C PPE as precaution
	Breathing Zone	PID	0.0	Crew switches to Level D based upon breathing zone air monitoring results
1430	Base of Hole	PID	0.0	slight odor
	Breathing Zone	PID	0.0	
1445	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
1510	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
1600	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
1615	Base of Hole	PID	0.0	slight odor
	Breathing Zone	PID	0.0	
1625	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
1630	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	

* See Boring Logs for PID readings of soil core samples

MWH
MONTGOMERY WATSON HARZA

DAILY AIR MONITORING LOG
ACS NPL SITE
Griffith, Indiana

Date: 9/18/01	Page 1 of 1
Site Activity: Installation of Off-Site Area Piezometers	
Monitoring Performed by: C. Smith	

Time	Monitoring Location*	Instrument	Reading (ppm)	Comments
755	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
800	Base of Hole	PID	0.1 to 2.1	garbage-like odor
	Breathing Zone	PID	0.0	
815	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
830	Base of Hole	PID	0 to 20	soil cuttings
	Breathing Zone	PID	0.0	
1015	Base of Hole	PID	3 to 5	soil cuttings
	Breathing Zone	PID	0.0	
1050[1]	Base of Hole	PID	-	
	Breathing Zone	PID	2 to 4	Level C PPE is worn
1100[1]	Inside Augers Removed from Hole	PID	131.0	Level C PPE is worn
	Breathing Zone	PID	2 to 5	Level C PPE is worn
1225[1]	Base of Hole	PID	0.7	
	Breathing Zone	PID	0.0	
1256[1]	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
1430[1]	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
1505[1]	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	
1600[1]	Base of Hole	PID	0.0	
	Breathing Zone	PID	0.0	

* See Boring Logs for PID readings of soil core samples

1. Due to a low battery on the primary PID meter, a secondary PID meter was used for this reading.

CAS/TMK
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